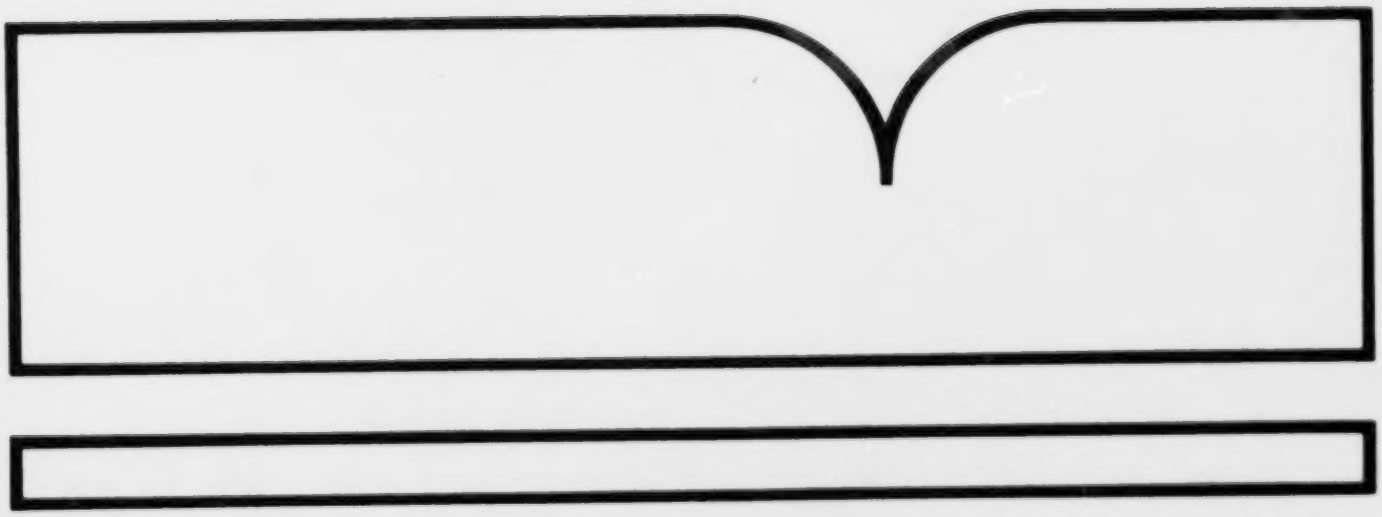
PB87-189049

Superfund Enforcement Decision Document (EPA Region 5): A and F Materials Company Greenup, Illinois, August 1986

(U.S.) Environmental Protection Agency
Washington, DC

14 Aug 86



U.S. Department of Commerce
National Technical Information Service
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United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R05-86/045
August1986

PB87-189049

EPA

Superfund Enforcement Decision Document:

A & F Materials, IL

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EPA/ROD/R05-86/045		PB87 189049/AS

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ENFORCEMENT DECISION DOCUMENT A&F Materials, IL (Second Remedial Action)	August 14, 1986 6. PERFORMING ORGANIZATION CODE
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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The A&F Materials site is located on three and three-quarter acres in Greenup, IL. The site, originally an undeveloped backwater flood zone for the Embarras River, was first developed for a sawmill operation. Mr. Ken Ault purchased the site for the A&F Materials recycling plant, which began operations in March 1977 and continued until it shut down in 1980. The plant processed waste materials (including but not limited to oil, sludge, caustic and sulfuric acid) into fuel oil and fire retardant chemicals. During the course of operations, there were numerous violations of the operating permit issued to the plant by the IEPA. By March 1978, four storage lagoons became filled and began to overflow, contaminating the soil and drainage pathway. In addition, thirteen steel storage tanks containing a mixture of waste oils (contaminated with PCBs and organics), sludges, spent caustics and acids, contaminated water and other waste products, were located onsite. The tanks had failed on several occasions, releasing their contents. In March 1980, May 1982, and December 1982, actions were taken at the site to lower the immediate potential of releases. These actions included lowering the level of wastes in the lagoons, diking, trenching, cleanup and removal of onsite and offsite wastes. In addition, a temporary cap was placed on the consolidated sludge in March 1983. In September 1984, the Aluminum Company of America, Northern Petrochemical, CAM-OR Inc. and Petrolite Corporation entered into a Partial Consent Decree (PCD)
(See attached sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Enforcement Decision Document A&F Materials, IL (Second Remedial Action) Contaminated Media: gw Key contaminants: VOCs, organics, TCE, metals		

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EPA/ROD/R05-86/045
A&F Materials, IL
(Second Remedial Action)

16. ABSTRACT (continued)

whereby the companies agreed to undertake surface cleanup at the site as an additional removal and remedial action. Pursuant to this PCD, an RI/FS was prepared by the consenting defendants which determined the amount of soil/sludge to be removed and the extent and flow direction of ground water contamination. Following the soil removal in 1985, only phenols and benzoic acid were detected above the non-detectable limits. The most significant contaminants of concern found during the RI/FS include: sulfates, inorganics, TCE, and metals.

The selected remedial action for the site includes: ground water monitoring of the natural purging and dilution of contaminants; institutional controls; and establishment of procedures for regular review of monitoring data. There is no estimated capital cost associated with this remedy, however, the PRPs have agreed to pay the estimated annual O&M costs of $24,000.

ENFORCEMENT DECISION DOCUMENT

REMEDIAL ALTERNATIVE SELECTION

Site: A & F Materials Company, Greenup, Illinois

Documents Reviewed

I am basing my decision primarily on the following documents describing the analysis of the cost and effectiveness of remedial alternatives for the A & F site in Greenup, Illinois:

- "Remedial Investigation Report, A & F Materials Company Site, Greenup, Illinois", Engineering-Science, October, 1984.

- "Feasibility Study Report, A & F Materials Company Site, Greenup, Illinois", Engineering-Science, January, 1985.

- Summary of Remedial Alternative Selection - Groundwater

- Community Relations Responsiveness Summary - Groundwater

- Partial Consent Decree, dated September 12, 1984

- Enforcement Decision Document, dated June 14, 1985

Description of Selected Alternatives

The selected remedy consists of the following elements:

1. Establish a groundwater monitoring program adequate to test the Feasibility Study Report conclusion that all residual groundwater contamination remaining after the 1985 surface cleanup will steadily decrease to safe levels by natural dilution and purging to the Embarras River without causing violation of Water Quality standards in the River, or passing under the River.

2. Establish institutional controls adequate to assure that drinking water wells are not placed in contaminated groundwater areas during the period of natural purging and dilution.

3. Establish procedures for regular review of monitoring data until safe levels are reached, or until data contradicting the Feasibility Study conclusions demonstrates the need to re-evaluate the selected remedy.

Declarations

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300) and after consultation with the Illinois Attorney General and the Illinois Environmental Protection Agency, I have determined that the above remedy for the A & F Materials site in Greenup, Illinois is a cost effective remedy that provides adequate protection of public health, welfare and the environment. In addition, the action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy.

Valdas V. Adamkus
Regional Administrator

August 14, 1986
Date

Attachments:

Summary of Remedial Alternative Selection
Community Relations Responsiveness Summary
Partial Consent Decree, dated June 14, 1985

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION - GROUNDWATER
A & F Materials Site, Greenup, Illinois

I. Site Location and Description

The A & F Materials site is located on three and three quarter acres of land on West Cumberland Street in Greenup, Illinois (Figure 1). The site is bounded by open farmland/woodland, the Village of Greenup wastewater treatment plant, and private residences (Figure 2).

Drainage from the site reaches the Embarras River by a ditch along the Illinois Central Railroad tracks. The site has a pronounced slope toward the Embarras River. The portion of the site outside of the facility fenceline is in the river's 100-year floodplain. The City of Newton occasionally withdraws drinking water from the Embarras River twenty-one miles downstream of the site. No drinking water wells are presently located between the site and the Embarras River, the presumed discharge point of the shallow groundwater systems. Geological information indicates that the site is underlain by sandy deposits associated with recent stream development. These alluvial sands overlie a sand and gravel deposit of glacial outwash origin. The site is located on a hillside which discharges runoff from rainfall directly onto the site.

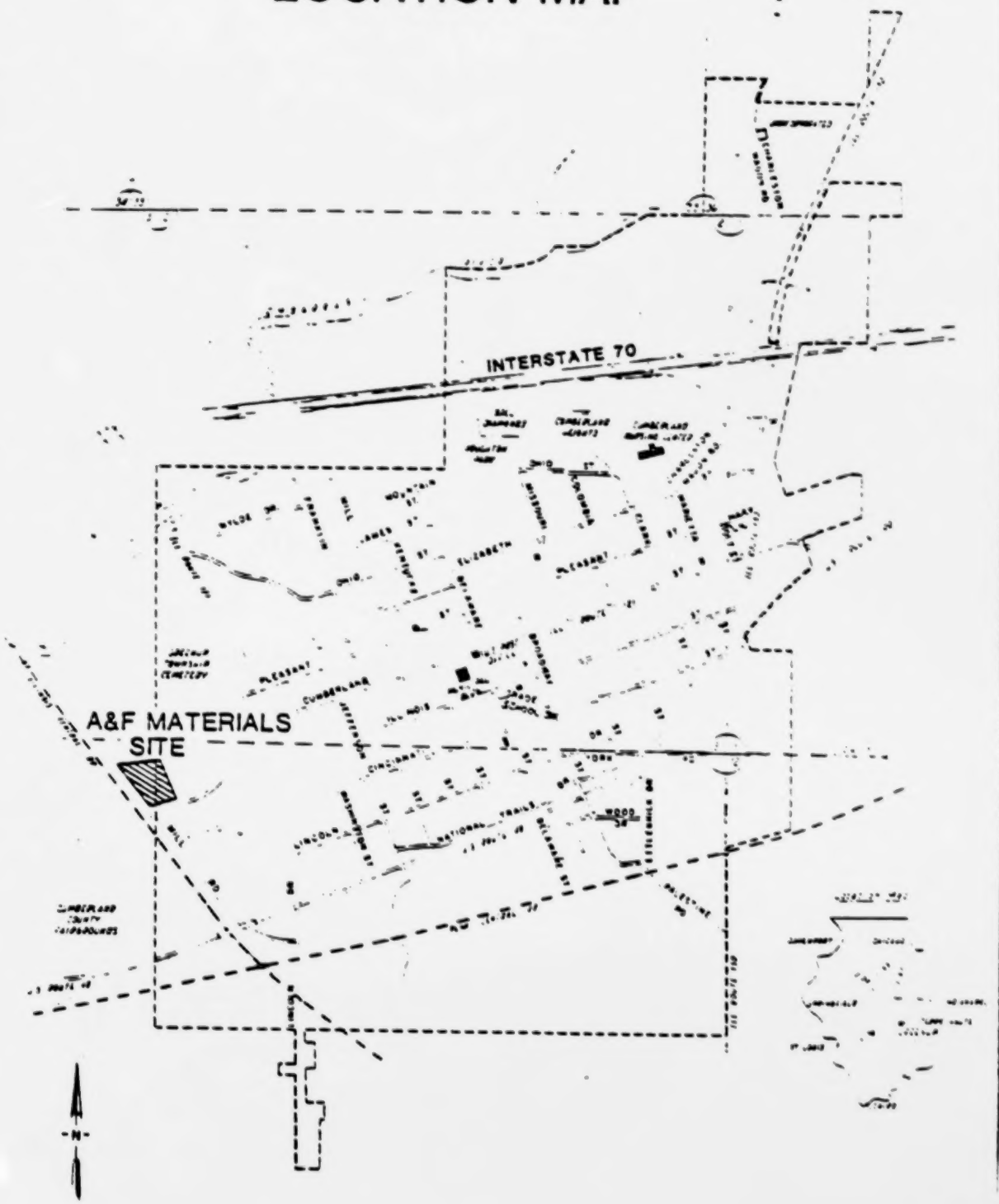
II. Site History

This site area was originally an undeveloped backwater flood zone for the Embarras River. The facility's property itself was first developed for a sawmill operation. It was this vacant property that Mr. Ken Ault first leased and later purchased for the operations of the A&F Materials recycling plant. The A & F Materials facility began operation in March 1977 and continued until it shut down in 1980. The operation processed waste materials (including but not limited to oil, sludge, caustic and sulfuric acid) into fuel oil and fire retardant chemicals. During the course of operations, there were numerous violations of the operating permit issued to A & F Materials by the Illinois Environmental Protection Agency (IEPA). By March 1978, four storage lagoons became filled and began to overflow, contaminating the soil and drainage pathways leading to the Embarras River. In addition, thirteen steel storage tanks containing a mixture of waste oils (contaminated with PCBs and organics), sludges, spent caustics, spent acids, contaminated water and other waste products, were located on the site. The tanks had failed on several occasions, releasing their contents.

After the closure of the facility in 1980, the site was classified as an abandoned hazardous waste site under CERCLA. There have been numerous preliminary investigations and short-term removal actions sponsored by U.S. EPA and IEPA to secure the site and prevent the release of contaminants.

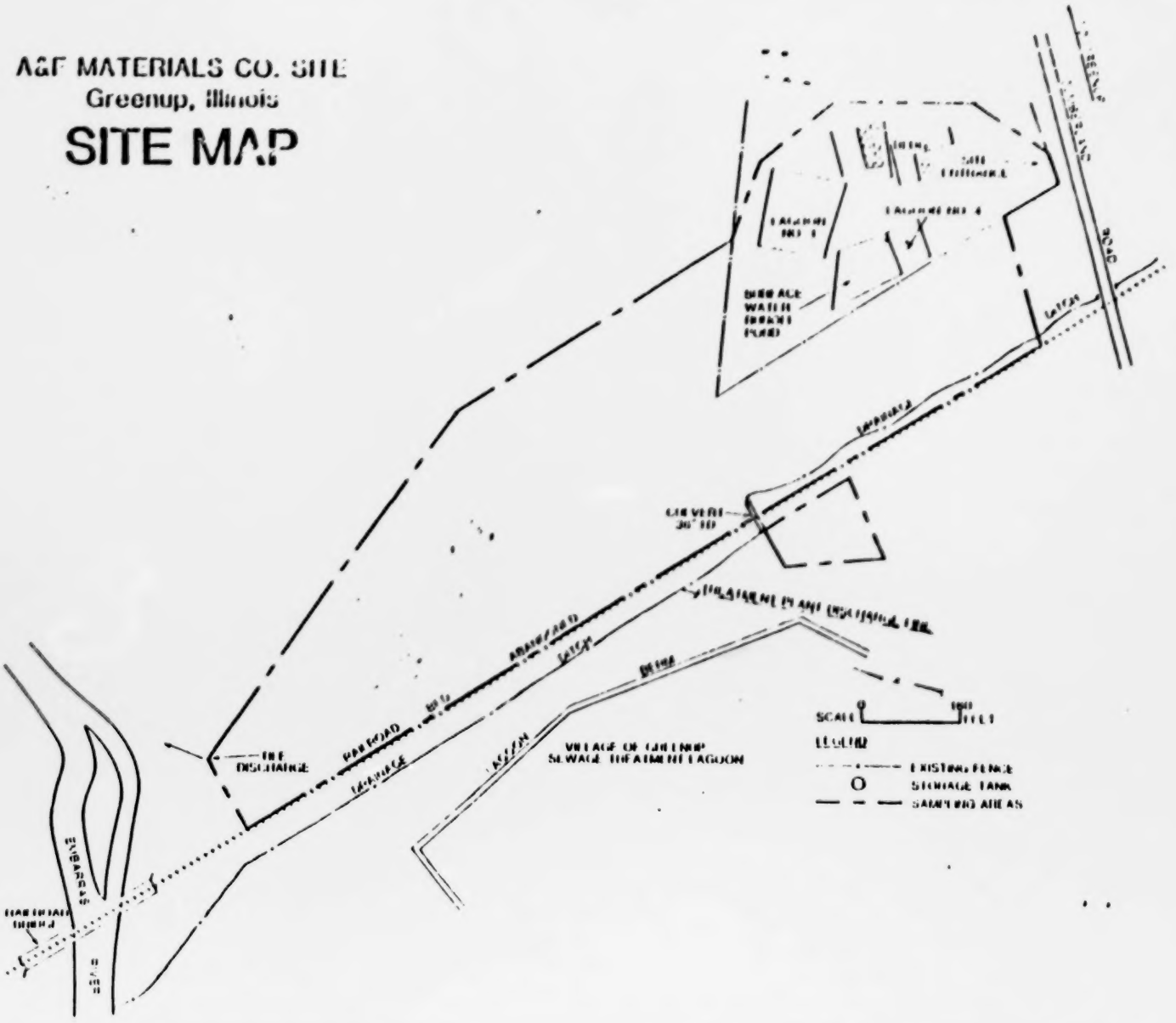
A&F MATERIALS CO. SITE
Greenup, Illinois

LOCATION MAP



A&F MATERIALS CO. SITE
Greenup, Illinois

SITE MAP



The A & F Materials Company site was included on the proposed National Priorities List of December 1982. The site was ranked 62 out of an original total of 419. The December 1982 list was made final in September 1983.

III. Current Site Status

In March 1980, May 1982, and December 1982, various actions were taken at the site to lower the immediate potential of releases. These actions included lowering the level of wastes in the lagoons, diking, trenching, cleanup and removal of on-site and off-site wastes. In addition, in March 1983 a temporary cap was placed on the consolidated sludge.

On September 12, 1984, a Partial Consent Decree was entered into by four companies, Aluminum Company of America, Northern Petrochemical, CAM-OR Inc. and Petrolite Corporation. Under the terms of the Consent Decree, the Companies agreed to undertake surface cleanup at the A & F Materials site as an additional removal and remedial action. As a part of that removal action, a total of 60,000 gallons of caustic waste and 4,000 gallons of PCB-contaminated oil from the tanks, 10,000 tons of soil/sludge from the lagoons, and 20 drums have been removed from the site.

Pursuant to this Partial Consent Decree, a remedial investigation/feasibility study (RI/FS) was prepared by the Consenting Defendants which determined the amount of soil/sludge to be removed. Approximately 1,600 tons of soil/sludge, an estimated 1,332 cubic yards of PCB contaminated soil, and a process building with contaminated equipment were removed from the site pursuant to the Enforcement Decision Document which was signed June 14, 1985 (see Attachment 1).

As part of the RI/FS, the Consenting Defendants conducted an investigation of the A & F Materials site to determine the extent and flow direction of the ground water contamination. The site lies on a varying thickness of alluvium till (3.1 to 21.0 feet thick) which overlays a sand & gravel zone varying in thickness from 2 feet to 26 feet. Glacial till was encountered only in the upland area on the east side of the site and was determined to be 27 feet thick. The whole unconsolidated formation mantles a Pennsylvanian shale of an unconformable nature. The bedrock was horizontally layered and has fracture zones at various depths. The soil covering the site is variable in nature and probably represents an erosional slump feature from the surrounding bluffs or a floodplain depositional sequence rather than weathered, in situ Illinoian till.

The most significant contaminants that have been found in the groundwater during the RI/FS are sulfates, high total dissolved solids, trichloroethylene, and metals. These contaminants have been found at elevated levels were the tanks and lagoons were once located, and diminish in amounts as the distance increases from the site. All groundwater sampling was done prior to completion of the 1985 surface and soil cleanup.

There are three aquifers of concern: the alluvial till aquifer (near the surface), sand & gravel aquifer (10 to 20 feet deep), and the bedrock aquifer (50 to 60 feet deep). Contaminants have been found primarily in the alluvial till/sand & gravel aquifers with very small quantities of contaminants found in the bedrock aquifer. The direction of the groundwater flow, based on present data, is believed to be to the north and west of the site. There are no groundwater wells used for drinking immediately downgradient of the site. The groundwater on the south side of the river flows to the north and west at a gradient of 0.013 and 0.006 respectively while groundwater north of the site flows to the southwest at a gradient of 0.016. There is a municipal drinking water well across the Embarras River and approximately a half mile to the east. Additional monitoring is required to insure that contaminants will not migrate under the Embarras River toward this well field, especially during Springtime flooding of this area which may reverse flow gradients of the groundwater (See Figures 3 and 4).

The soils remaining on-site after the 1985 soil removal were sampled and analyzed prior to placing clean soil over the area as fill. The results of the analysis are attached (see Attachment 2) and can be summarized as follows: all compounds tested, including PCBs, were at non-detectable limits using low detection limits, only phenols at 14 ppm, 3.5 ppm, and 3.3 ppm and benzoic acid at 2.1 ppm were detected in two pocket areas. All other areas showed no contamination at the detection limits. The area was then graded, vegetated, and is presently being maintained by the PRP's with monthly inspections. A magnetometer survey done in February, 1986, by the U.S. EPA showed no apparant buried material left at the site.

The primary public health endangerment associated with groundwater contamination is the possibility of ingestion. Elevated sulfate and total dissolved solids may lead to taste and diarrhea effects in humans. Trichloroethylene and other similar solvents have some evidence of carcinogenicity. Elevated levels of metals may lead lead to heavy metal poisoning, if ingested. After the removal actions already undertaken at the site, a major potential pathway for continous contaminant migration into the groundwater was removed.

IV. Federal Enforcement

A Federal lawsuit to bring about site cleanup at Greenup was initiated by the filing of a Complaint on September 3, 1980, pursuant to authority under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Sections 6901, 6973, and the Clean Water Act (CWA), 33 U.S.C. Sections 1251, 1311, 1319

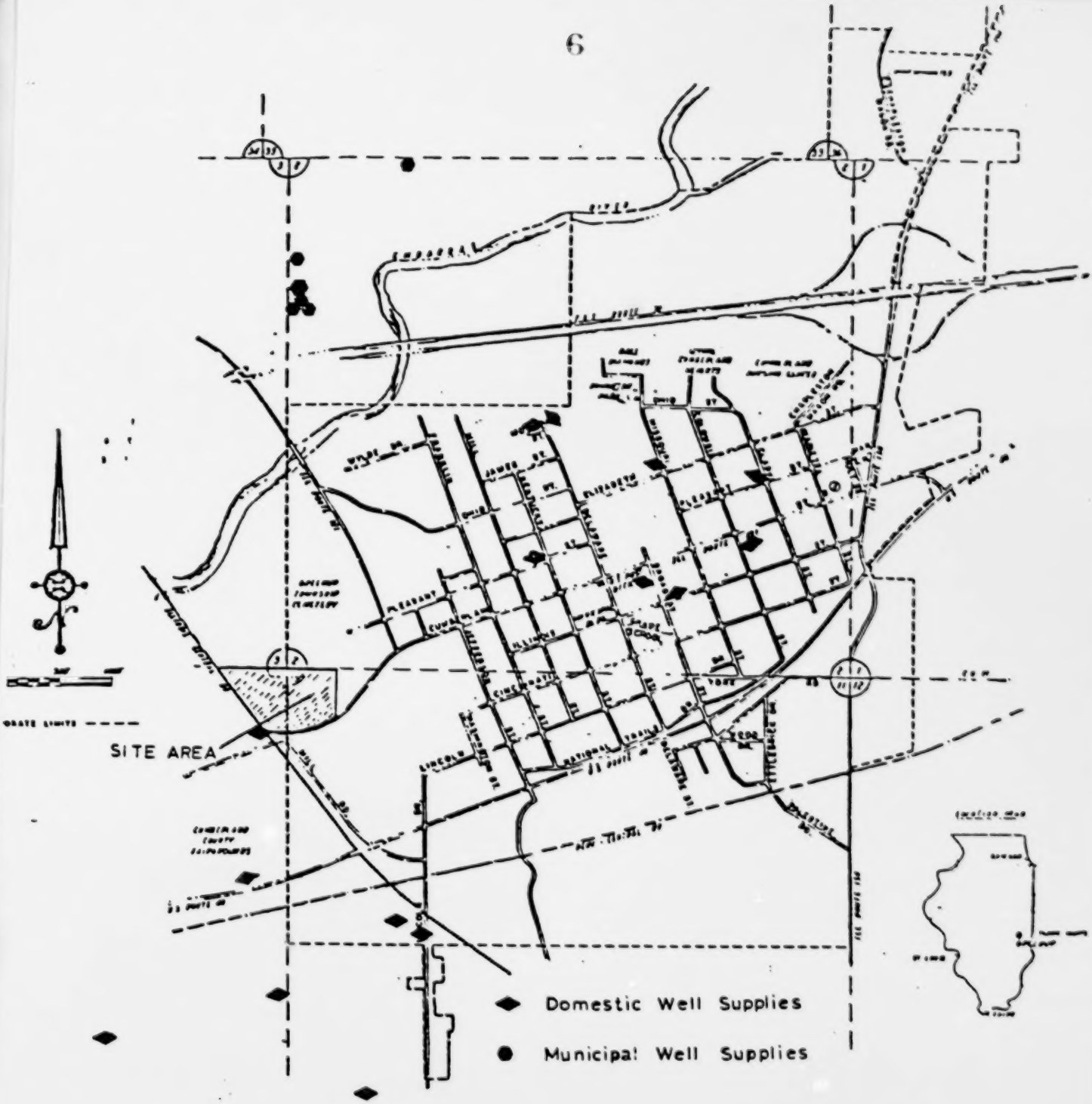


Fig.3 CITY MAP SHOWING DISTRIBUTION OF WATERWELLS
(Base map provided by city)

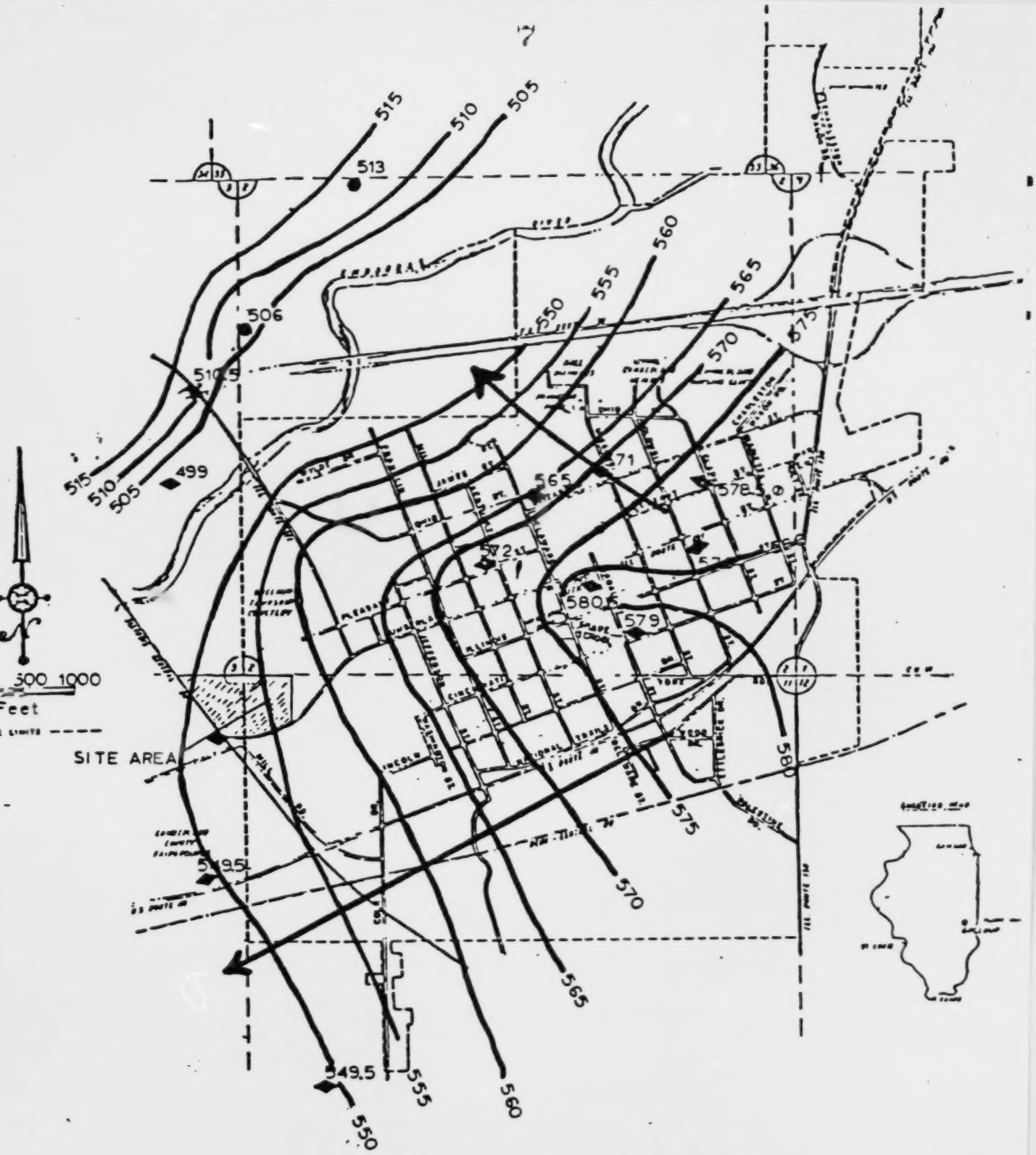


Fig. 4 POTENTIOMETRIC MAP OF GREENUP, ILLINOIS
(Base map provided by city)
CONTOUR INTERVAL - 5 FEET

and 1321. The Complaint alleged that the handling, treatment, storage and disposal of solid and hazardous wastes at the facility presented an imminent and substantial endangerment to health and the environment. The Complaint also cited the defendants for violation of Section 311(e) of the CWA, as evidenced by overflows from the pits. The original Complaint did not include generators as defendants.

Letters to all known generators, dated November 3, 1981, were sent by the Assistant U.S. Attorney requesting their participation in site cleanup. Demand letters to the generators for the required remedial action were sent by the Department of Justice on August 18, 1982. Four generators were subsequently added to the lawsuit on February 14, 1983. Claims under Sections 106 and 107 of CERCLA, 42 U.S.C. 9606 and 9607, were also added.

On September 12, 1984, a Partial Consent Decree was entered into by the Consenting Defendants. Under the terms of the Partial Consent Decree, the Companies agreed to undertake a surface cleanup at the A & F Materials site as an additional removal action. This action consisted of emptying and disposing of the steel tanks and emptying and disposing of the sludges and soils in the storage lagoons.

Additionally, the Partial Consent Decree provided for the Consenting Defendants to conduct an RI/FS, to reimburse the U.S. for any additional emergency response taken at the site, and to reimburse the U.S. for $340,000, and reimburse the State for $40,000. Subsequently, McDonnell-Douglas entered into a Partial Consent Decree with the U.S. and the State, in which McDonnell-Douglas agreed to pay the U.S. $150,000 as reimbursement for past surface response costs at the site and negotiate on the final remedy.

Pursuant to the Partial Consent Decree, the Potentially Responsible Parties (PRP's) undertook two seperate surface cleanups of the site which included removal of 4 lagoons, 1 building, 20 drums, 13 tanks, and contaminated soil removal. The site is presently filled with clean soil, graded, and seeded for vegetation. The PRP's are insuring maintenance of this cover via monthly inspections which are written in a letter form report and mailed to the U.S. EPA Regional office.

The Consenting Defendants performed the RI/FS required by the Partial Consent Decree and submitted the RI and FS reports in 1984 and 1985 respectively. Upon written request, the PRP's continue to do groundwater monitoring of the site until the details for a final groundwater remedy can be thoroughly developed. The Consenting Defendant's RI/FS was performed over a 10 week timetable, and more field data is required to confirm the conclusions of the RI/FS. Specifically, more data is required to define the western edge of the plume, and to determine if the Embarras River is a recharging or discharging river and whether contaminants may travel under the river bed possibly reaching the town's municipal well.

V. Alternatives Evaluation

The groundwater wells gave variable results. Wells in the northern and the western flow paths from the contaminated site areas showed high sulfates, TDS, oil & grease values. Several metals were detected at levels higher than background. Groundwater monitoring indicates that elevated levels of inorganic and organic compounds are currently not discharging to the Embarras River. The Feasibility Study predicted that the dilution effect between the groundwater and surface water probably will result in little or no contamination of the Embarras River from the ground water (see page 4-6, 4-9, 4-10, 4-11, 4-12, and 5-1 in the Feasibility Study). The high velocity through the aquifer will permit flushing of any residual pollutants. The contaminated materials and soils that were removed from the site eliminated the main source for continuous leaching of contaminants into the groundwater. The primary health concern is with the possible future development of the site and tapping of the present groundwater sources to be used for potable drinking water supplies, therefore, the aquifer of concern according to the U.S. EPA Ground Water Protection Strategy (August, 1984) is a Class IIB aquifer. Presently there are no drinking water wells to the north and west of the site.

Based on the analysis conducted pursuant to §300.68(c), (d), and (e), several technologies for addressing ground water contamination were initially screened: site monitoring; containment such as capping the site and impermeable barrier walls; pumping of the groundwater; in-situ treatment such as biological treatment, leaching/extraction, landfarming, and physical/chemical; collection of drainage such as interceptor trenches and treatment beds; diversion grading; alternative drinking water supplies; and no action. To the extent that it was both possible and appropriate, at least one alternative was developed in each of the following categories:

(i) Alternatives for treatment or disposal at an off-site facility as appropriate; the alternatives in this category are: interception or pumping of the groundwater for treatment on-site and then discharge to a drainage ditch off-site; interception or pumping of the groundwater for treatment and then discharge to a water treatment plant; pumping the water to deep well injection; off-site removal of the residues from treating the water with ion exchange or reverse osmosis. These alternatives would recycle the treated water but would not result in waste minimization or destruction.

(ii) Alternatives that attain applicable or relevant and appropriate Federal public health and environmental requirements; the alternatives in this category are: all of the above listed alternatives, including the natural purge and dilution with groundwater monitoring, with the exception of using reverse osmosis to treat the pumped groundwater due to undemonstrated effectiveness and reliability, diversion grading

used alone, and the no action alternative. In-situ treatment would result in waste minimization and destruction if done properly and thoroughly.

(iii) As appropriate, alternatives that exceed applicable or relevant and appropriate Federal public health and environmental requirements; the alternatives in this category are: pumping and treating of the groundwater, alternate drinking water supplies. Pumping and treating the groundwater would recycle the water but would not result in waste minimization or destruction.

(iv) As appropriate, alternatives that do not attain applicable or relevant and appropriate Federal public health and environmental requirements but will reduce the likelihood of present or future threat from the hazardous substances and that provide significant protection to public health and welfare and the environment; the alternatives in this category are: capping and diversion grading which would not result in waste minimization or destruction or recycling.

(v) The no action alternative was rejected because there presently are some contaminants in the upper two aquifers. The contaminants are not biodegradable but should diminish in strength through natural flushing and dilution of the area.

The preliminary screening criteria used consisted of three different sets of critera. The first set of criteria was for technical reasons such as effectiveness and reliability, site specific physical limitations, safety of technology, time-frame for implementation, and treatability of the wastes at site. The second set of critera were environmental and public health screening criteria such as danger to wildlife, aquatic life or plant life, public acceptance of alternative, potential exposure routes, potential exposure routes, exposure time-frames, irreversible or irretrievable commitments of resources, and improvement in resources. The third set of criteria were regulatory criteria such as applicable standards, permits necessary, and acceptability to other agencies.

Based on preliminary screening, four alternatives for ground water were developed and analyzed in detail: 1) isolation of the contaminated water, 2) recovery of the contaminated water with subsequent on-site treatment and discharge, 3) isolation of the contaminated water followed by recovery within the zone of isolation, treatment and recharge, and 4) monitoring.

The four alternatives are futher described below:

1. Isolation of the Contaminated Water

   The objective of this alternative is to isolate the contaminated water. An impermeable barrier such as a slurry wall or grout curtain would be used to divert ground water flow away from the site area. A cap would be used to prevent infiltration of rainwater within the area encompassed by the slurry wall. In addition to limiting the long-term use of the land, this alternative does not remove contaminated ground water from the site.

2. Recovery of Contaminated Water through Downgradient Wells, On-Site Water Treatment, and Discharge of Effluent to Drainage Ditch

   The objective of installing recovery wells is to capture, for treatment, contaminated water coming from the site. A line of 10 wells placed hydraulically downgradient from the site would be used for this purpose. The water collected would be treated for oil and grease, sulfate and metals removals, and then discharged to the drainage ditch adjacent to the site. This is the most expensive of the ground water alternatives analyzed.

3. Isolation and Recovery of Ground Water with Subsequent On-Site Treatment and Recharge to the Aquifer System

   A slurry wall would be used to isolate contaminated ground water. A well located near the center of the enclosed area would withdraw contaminated water for treatment at an on-site temporary treatment facility. The water withdrawn from within the containment area would be treated for oil and grease, sulfate and metals removal. The water would be recharged into the containment area to aid in flushing of contaminants.

4. Monitoring Existing Wells

The intent of this alternative is to monitor the impact on ground-water quality created after the removal of the contamination source (oil/sludge from the lagoons and contaminated soils). The processes of naturally occuring flushing and dilution of the residual contamination would provide a means for improving ground-water quality in the area.

Contaminated water remaining in the aquifer system would be flushed naturally. The level of contaminants in groundwater discharging from the alluvium to the outwash aquifer should begin to diminish after cleanup of the site. The level of contaminants in the outwash should then begin to diminish in the site vicinity with a gradual reduction in contaminant levels through the aquifer system.

Groundwater quality would be monitored quarterly and monitoring would continue for approximately 10-15 years or longer, if necessary, until such time as the contaminant levels in the aquifer system are at acceptable levels. The details of the groundwater monitoring plan will need to be submitted by the Consenting Defendants to the U.S. EPA and the State for approval prior to implementation.

See Table 1 for a summary of these alternatives and their respective costs.

a. Groundwater Impacts

A summary of groundwater data collected at the site during June, July, and September, 1984, and August, 1985, in comparison with applicable or relevant and appropriate groundwater criteria is provided on Table 2. Only those constituents found at levels above the analytical detection limits are shown. The locations of the monitoring wells are shown on Figure 5.

There are currently no drinking water or other production wells located in the area immediately downgradient of the site. The data were also evaluated assuming future development of the site of the land between the site and the Embarras River. If the site was used in the future prior to attenuation and diminution of the contaminants through natural actions then the following cancer

TABLE 1

SUMMARY OF PREFERRED REMEDIAL ACTIONS FOR CONTAMINATED GROUNDWATER

Alternative	Description	Benefits	Environmental Impacts	Capital Cost	Operation and Maintenance Cost (Annual)
Capping coupled with an impermeable barrier to isolate contamination	A slurry wall would be used to divert ground-water flow away from the contaminated area. A cap would be used to prevent infiltration of rainwater to the area enclosed by the slurry wall.	Minimizes migration of contaminants.	Long-term limited use of land. Contaminated ground water is not removed from site. Potential for future migration of contaminants.	$1,300,000	$24,000
Recovery of contaminated water from wells placed downgradient from site	Recovery wells downgradient capture contaminated water. Water would be treated for oil and grease, sulfate and metals removal. Water would be discharged to the drainage ditch adjacent to site.	Contamination removed from site.	None since treatment would reduce contaminants to within allowable limits for discharge.	$3,700,000	$1,135,000
Isolation and recovery of ground water	A slurry wall would be used to isolate contaminated ground water. Water withdrawn from within the containment area would be treated for oil and grease, sulfate and metals removal. Water would be recharged into the containment area to aid in flushing of contaminants.	Contamination removed from site.	None since treatment would reduce contaminants to within allowable limits for discharge.	$3,625,000	$700,000
Monitoring ground water quality after removal of the source of contamination to observe effectiveness of natural flushing	Monitor existing wells in the zone of contamination. Samples would be collected quarterly until the contaminant levels decrease to acceptable levels.	Contamination flushed from site by flow of ground water.	None since dilution prior to and upon entering surface water body would reduce contaminants to trace levels. There are no groundwater wells downgradient from the site that would be adversely affected.	$0	$24,000

TABLE 2
GROUNDWATER EVALUATION

Compound	Illinois[7] Pollution Drinking Water Standard	USEPA Criteria	Source of USEPA Criteria	Results for Well 1-D (Background)	Maximum level found	Well ID
Trichloroethylene, ppb		2.8/5.0	8/5	< 5 45*	72*	M-5D
Phenolics, ppb	1.0	3500	3	<10 5*	18.5*	M-3D
Benzene, ppb		0.7/5.0	8/5	< 5	7*	M-3D
Tox, ppb				13	212	M-6D
Sulfates, ppb	250 ppm	250	6	56* 54*	3915*	M-3D
Nitrates, ppb	10 ppm	10	1	.79	1.8	M-6S
Total Dissolved Solids, ppm	500	500	6	1777*	5468*	M-3D
Oil & grease, ppm	0.1			6.4* 5.2*	60+	M-3S
Chloride, ppm	250	250	6	57*	69*	M-3S
Conductivity (ohms/cm)				650	4300	M-3S
Copper, ppm	0.02	1.0	2 & 6	.035*	.18*++	M-2S
Nickel, ppm		13.4	4	<50	.43	M-2S
Silver, ppb	5	50	1	<10*	35*	M-5S
Aluminum, ppm				.58*	77*	M-2S
Zinc, ppm	1.0	5.0	6	.42*	1.9*	M-2S
Iron, ppm	1.0	0.3	6	1.4*	242*	M-3D
Lead, ppb	50	50	1	90*	325*	M-2S
Manganese, ppm	0.15	0.05	6	.6*	205*	M-3D
Chromium, ppb	50	50	1	<50	170*	M-2S
Cadmium, ppb	10	10	1	< 1	14.*	M-2S
Barium ppm	1.0	1.0	1	< 0.5	6.8	M-4S
Arsenic, ppb	50	50	1 & 2	< 3	4	M-9D
Thallium, ppb		13	3	< 3	42	M-5S

NOTES:

*ave. of more than 1 sample per well

+ discounts June/July 1984 sampli event for shall wells; oil & grease for well M-5D is 32.

++ discounts Swim' well

SOURCE OF U.S. E CRITERIA:

1. Safe Drinkin Water Act/MC
2. Safe Drinkin Water Propos /RMCL
3. Water Qualit health toxic
4. Water Qualit taste & odor
5. Safe Drinkin Water Act proposed MCL
6. Sec. Dr. Wat Standard
7. Illinois PCB rules & regs Title 35 Subtitle C.
8. 10^{-6} CAG Nos

A & F MATERIALS CO. SITE
Greenup, Illinois

TEST BORING AND MONITORING WELL LOCATIONS

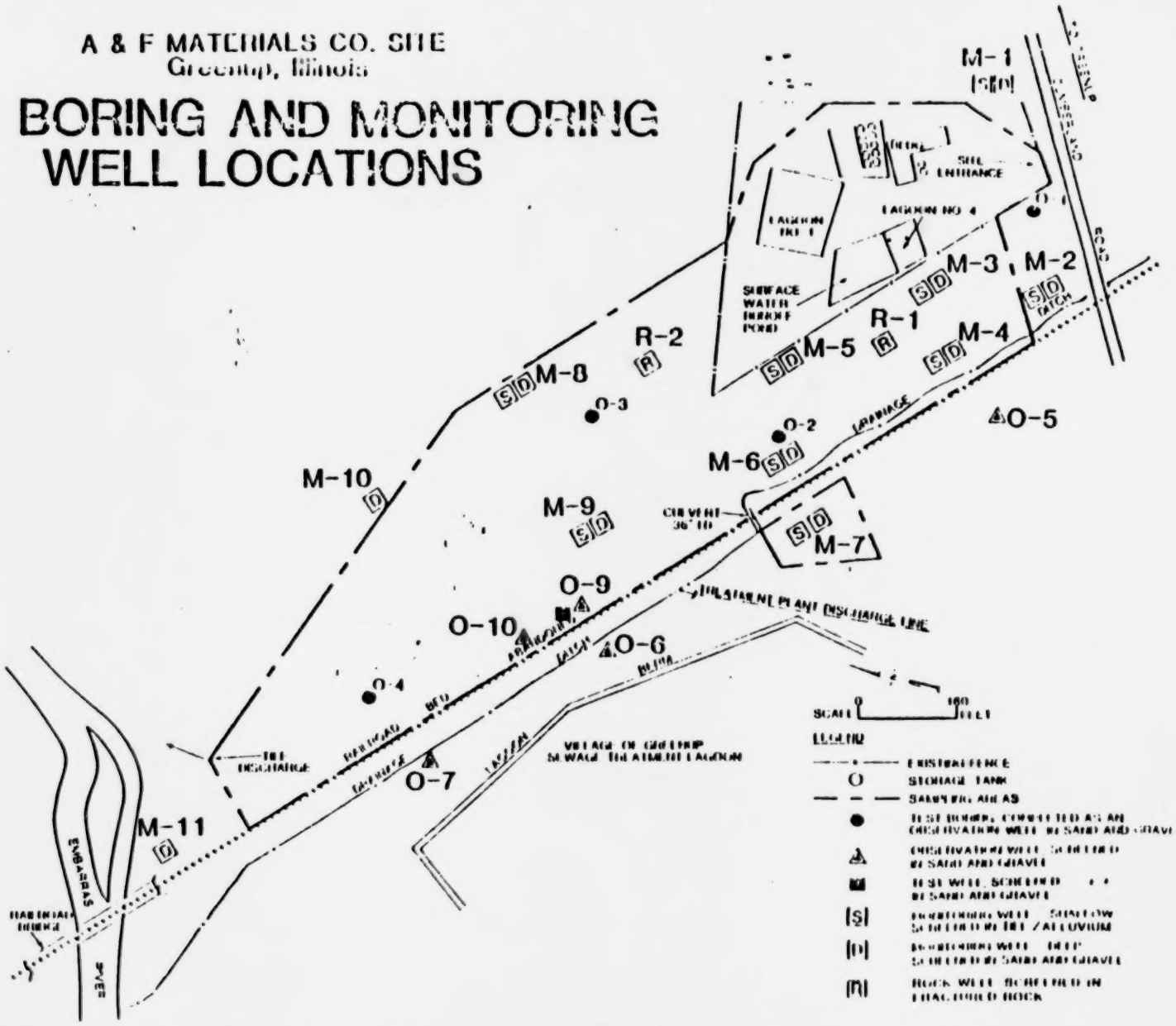


FIGURE 5

risk levels would be presented in the drinking water:

Compound	Risk Level
trichloroethylene	4 x 10-5 (14.4 times proposed MCL)
benzene	9 x 10-5 (7 times proposed MCL)
lead*	NA (16 times proposed RMCL)
chromium	NA (1.4 times proposed MCL)
barium	NA (6.8 times MCL)
thallium	NA (3.2 times human health criteria)

NA - not available
MCL - Maximum Contaminant Level under Safe Drinking Water Act
RMCL - Recommended Maximum Contaminant Level under Safe Drinking Water Act
* - background exceeds 10-6 risk level

The following Illinois Pollution Control Board (IPCB) standards would also be exceeded if the groundwaters were withdrawn from the site for distribution as a potable supply or for food processing:

Compound	Risk Level
phenolics	18.5 times IPCB standard
sulfates**+	15.7 times IPCB standard
total dissolved solids+°	10.9 times IPCB standard
oil & grease***+°	600 times IPCB standard
lead**	6.5 times IPCB standard
chromium	3.4 times IPCB standard
cadmium	1.4 times IPCB standard
barium	6.8 times IPCB standard

* - existing concentrations in deeper rock wells also exceed standard
** - background equals or exceeds standard
+ - not hazardous substances as defined by CERCLA
° - significant levels of oil & grease found to be naturally occurring in lower aquifers beneath the site

Since the groundwaters at the site pose a cancer risk greater than 10-6 if those waters were consumed at a rate of 2 liters per day by a 70 kg person for 70 years, institutional controls will be required to prevent consumption of this water.

b. Surface Water Impacts

All organic constituents for surface waters were below detection limits except phenol which was found to probably originate from an upstream location. Metals were all at expected levels except for an elevated lead level from an upstream sample. There was an elevated lead level in the ditch that runs on the west side of the study area, but a municipal sewage treatment lagoon is located immediately west of the ditch with a treatment plant discharge line at the points where the elevated lead levels were found (see page 6-20 in the Remedial Investigation).

The cost-effective remedy recommended by the PRP's is monitoring of the groundwater after removal of the source of contamination to observe the effectiveness of the natural flushing of the site and would cost approximately $24,000 not including installation and monitoring of any extra wells. The other three alternatives were: capping and isolation of groundwater at an approximate capital plus operating and maintenance costs of $1,404,000; recovery of contaminated water from wells placed downgradient from the site at an approximate capital plus operation and maintenance costs of $4,825,000; and isolation and recovery of groundwater at an approximate capital plus operation and maintenance costs of $3,325,000. (See table 3 for present value costs.) Since the primary sources of the contaminants have been previously removed including the process building, its foundation, and the contaminated soil and the contaminants found in the groundwater were primarily at elevated levels near the processing areas with diminishing contaminant levels further away from the site, the Agency agrees that groundwater monitoring should be the alternative of choice, but the monitoring must be done on a broader scale than the proposal by the PRPs, and institutional controls will be necessary. These provisions will increase the cost of the selected alternative over the $24,000 figure, but this alternative will still be far less costly than the other evaluated alternatives.

The contaminants of interest are those listed in table 2.

c. Action Levels.

Action levels will be followed at selected groundwater well(s) in order to provide protection for human health and the environment. Until a more field data can be collected and a more detailed groundwater plan can be developed by the Consenting Defendants which will include more monitoring wells to the north and west and since there are no drinking water wells immediately downgradient of the site, the interim monitoring points for the area north of the site should be well M-11. This well is located at the approximate point that the contaminated plume would reach the Embarras River, and could there-

TABLE 3

COST SUMMARY FOR GROUND WATER REMEDIAL ALTERNATIVES

Remedial Alternative	Capital Cost	Operation and Maintenance Cost	Present Value[1]	Annual Cost[1]
Alternative A: Capping/Impermeable Barrier	$1,380,000	$24,000	$1,525,000[2]	$275,000[2]
Alternative B: Downgradient Recovery Wells and Treatment	$3,700,000	$1,125,000	$8,000,000	$2,100,000
Alternative C: Isolation, Recovery and Treatment	$2,625,000	$700,000	$5,250,000	$1,400,000
Alternative D: Monitoring	$0	$24,000	$150,000[2]	$24,000

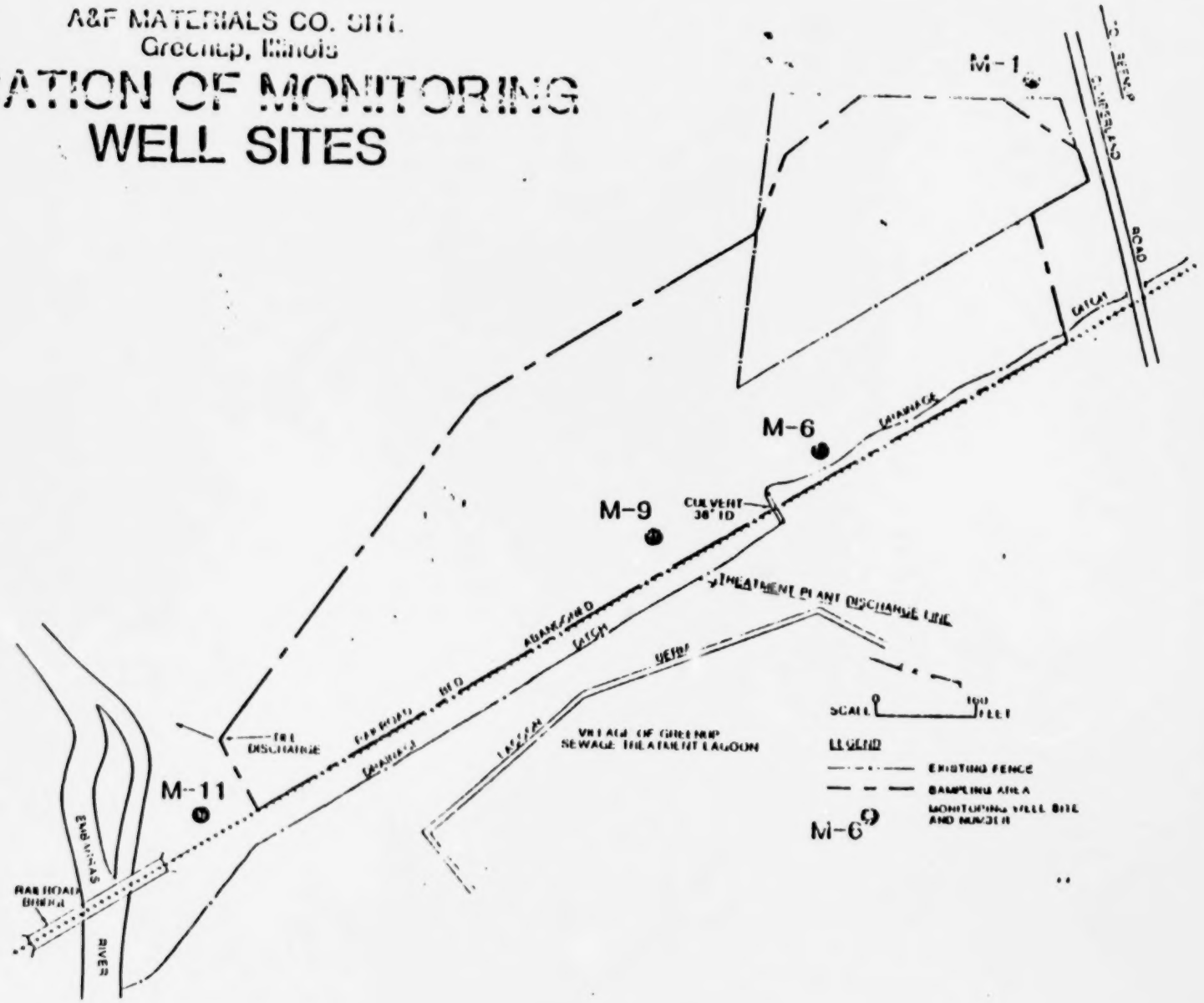
(1) Assumed interest rate of 10%.

(2) Based on a useful life of 10 years. Other alternatives are based on a life of five years.

SECTION 5

A&F MATERIALS CO. SITE
Greenup, Illinois

LOCATION OF MONITORING WELL SITES



fore provide possible warning if high levels of contaminants are about to enter, or pass under, the River. The action levels, will be the U.S. EPA Criteria listed in table 2 which includes the 10^{-6} cancer risk criteria. The monitoring points to the west of the site will need to be determined after the installation of wells that are required in order to define the western edge of the plume. A contigency plan needs to be prepared and ready to implement if the action levels are exceeded.

VI. Community Relations/Responsiveness Summary

Illinois EPA (IEPA) conducted an extensive community relations program which included several informal meetings in the homes of nearby residents, written updates, and frequent conversations with interested citizens, press, and local officials. The State, with U.S. EPA support, responded to their concerns. Public meetings, one of which was attended by staff from the Agency for Toxic Substances and Disease Registry, were also held by IEPA and U.S. EPA at several times during the RI/FS process.

When the Partial Consent Decree was filed in June 1984, U.S. EPA assumed the lead on community relations, although the State maintained an active cooperative role. Several public comment periods have been held, accompanied by public meetings, briefings, and other notification of interested parties. A five-week public comment period was available for the FS upon which this record is based.

There was some dissatisfaction among the public during the final months of the negotiations as some individuals apparently believed that they were unable to obtain feedback or response to their questions. However, they are pleased with what has been accomplished and the promptness of action once the Partial Consent Decree was signed. Information supplied by nearby residents has been useful in discovering the full nature of the contamination and is reflected in the recommendations for the site.

The responsiveness summary is attached (see Attachment 3).

VII. Consistency with Other Environmental Laws

Prior removal and remedial actions at the site have ensured compliance with the CWA, RCRA, and Executive Order 11988, "Floodplain Management".

When the levels of hazardous constituents return to below the applicable Federal standards, the action level limits will no longer be required.

The proposed option of ground water monitoring is consistent with U.S. EPA's Ground-Water Protection Strategy of August, 1984.

The provisions of RCRA most closely addressing the type of remedial action undertaken at the Site are the regulations covering closure of surface impoundments. The surface cleanup performed by the PRPs in 1985 constituted an attempt to "clean close", in RCRA terminology, under 40 CFR 265.228(b). If at site closure all contaminants are removed to background, the site is no longer subjected to RCRA requirements. However, monitoring data shows that the soils left in the bottom of the lagoon, when it was refilled with clean soil, contained residual contamination (see item III above). If a surface impoundment owner does not remove all contaminated soil, 40 CFR 265.228(c) requires a closure that includes groundwater monitoring and placement of a final cover. The groundwater monitoring required by the selected remedy at the A&F Greenup site satisfies the purposes of the RCRA groundwater monitoring requirement. The previously selected remedy for lagoon closure required clean backfill in the lagoon. The cover allows passage of liquids, which is appropriate here, promoting the predicted natural dilution and purging that is the basis for selection of the groundwater remedy.

TSCA was relevant to the surface cleanup of this site. Its provisions were considered in requiring the PRPs to excavate and dispose of sludge and soils contaminated at one part per million or higher of polychlorinated biphenyls (PCBs). Due to this level of cleanup of the surface, the selected groundwater remedy is fully consistent with TSCA.

The CWA, and the analagous state law provisions, set Water Quality standards for the Embarras River. The RI/FS predicts that the selected remedy will not cause violations of these standards in the River, and monitoring will be performed to specifically confirm this conclusion.

The Safe Drinking Water Act, and analagous state law provisions, set standards for water to be used for human consumption. If drinking water wells were to be placed into the contaminated groundwater, these standards would be violated. The selected remedy prevents such violations by requiring institutional controls to prevent construction of such drinking water wells until the levels of contamination in the groundwater have attentuated to safe levels.

VIII. Recommended Alternative

The Agency recommends that a groundwater monitoring alternative, combined with institutional controls and appropriate reopener provisions, be implemented to deal with ground water at the A & F Materials Greenup site. This alternative is the lowest cost alternative which is technologically feasible and reliable, which effectively mitigates and minimizes damage to the environment, and which provides adequate protection of public health, welfare, and the environment. The remedy of monitoring the natural purging and dilution of contaminants from the groundwater will in part depend on the future use of the land and groundwater. "Institutional controls", meaning the limitation on the use of the groundwater for potable uses, must be established. Several acceptable methods to accomplish this include:

1) deed restrictions,
2) State or County Ordinances,
3) the Department of Mines & Minerals has the authority to approve the installation of new drinking water wells in Illinois and will be contacted by the U.S. EPA for restricting the development of new drinking water wells in this area,
4) Prohibit the installation of wells through purchase of easements from property owners,
5) Pay the difference for a city hook-up instead of drilling any new wells in the affected area.

Institutional controls will be required until groundwater quality returns to background levels or below the State and Federal criteria shown in Table 2.

The monitoring alternative recommended by the Consenting Defendants proposes monitoring from 4 existing monitoring wells on a quarterly basis, for 10-15 years, for a limited number of parameters (see figure 6). However, a more comprehensive monitoring program than the one proposed by the Consenting Defendants is required. More monitoring wells to the north and west of the site must be installed. An additional background monitoring well(s) must be installed since the present upgradient well, M-1, is showing some signs of contamination as of the August, 1985, groundwater monitoring done by the Consenting Defendants. The reasons for this contamination in well M-1 are not clear at this time. The listing of contaminants from table 2 must be monitored. The details of the monitoring program will be discussed in the Groundwater monitoring plan that will be submitted by the Consenting Defendants to U.S. EPA and the State pursuant to Phase IV of the Partial Consent Decree.

IX. Operation and Maintenance

The Consenting Defendants are required to submit an operation and maintenance plan to be approved by U.S. EPA. U.S. EPA will require that the Consenting Defendants implement the approved plan.

X. Schedule of Future Actions

Negotiate agreement for PRP's to implement this EDD	Within 60 days after after this EDD is signed.
PRPs submit Groundwater Monitoring Plan and Operation & Maintenance Plan (including plan for institutional controls)	Will be negotiated or, if negotiations are unsuccessful, a motion for trial will be made to the court for a trail date within 120 days of signing this EDD.
EPA/State review	
PRPs submit revised plan, if necessary	
EPA/State approval of plan	
Begin implementing groundwater plan and impose institutional controls	

ATTACHMENT 1

Enforcement Decision Document

June 14, 1985

12 JUN 1985

Recommendation for Remedial Action at the A&F Materials Company Site, Greenup, Illinois

Robert B. Schaefer
Regional Counsel

Basil G. Constantelos, Director
Waste Management Division

Valdas V. Adamkus
Regional Administrator

On September 12, 1984, a Partial Consent Decree was entered into by four companies, Aluminum Company of America, Northern Petrochemical, CAM-OR Inc. and Petrolite Corporation, regarding the A&F Materials site. Under the terms of the Partial Consent Decree, the Consenting Defendants agreed to undertake a Remedial Investigation and Feasibility Study to determine the nature and extent of the contamination at the A&F Materials site, and to perform the recommended option for the surface cleanup.

The Consenting Defendants completed and submitted the Remedial Investigation and Feasibility Study for our review. We have reviewed these reports and all supporting documentation. Pursuant to Section 104(2) of CERCLA, we have consulted with the State of Illinois regarding the selected alternative. Based on our review, we recommend that soil contaminated over the recommended action levels, as well as the building and equipment, be removed and disposed off-site in order to protect human health, welfare and the environment. Site grading and placement of a vegetative cover will also be performed.

Attached is a summary of the alternative selection process with a detailed account of events that lead to this alternative selection. The required remedial action for the groundwater will be discussed in a separate document.

The authority to select CERCLA remedial actions for the A&F Materials site has been delegated to the Region effective March 8, 1985.

5HE-12:CERCLA:KVendl:ch:6-5-85:Disk#KVendl/chelm#2

ENFORCEMENT DECISION DOCUMENT

REMEDIAL ALTERNATIVE SELECTION

Site: A & F Materials Company, Greenup, Illinois

Documents Reviewed

I have reviewed the following documents describing the need for remedial alternatives at the A & F Materials site:

- "Remedial Investigation Report, A & F Materials Company Site, Greenup, Illinois", Engineering - Science, October 1984.

- "Feasibility Study Report, A & F Materials Company Site, Greenup, Illinois", Engineering-Science, January 1985.

- Summary of Remedial Alternative Selection

- Community Relations Responsiveness Summary

- Partial Consent Decree, dated September 12, 1984

Description of Selected Alternatives

1. Soils/Sediments
   - All soils contaminated over the recommended action levels, including soils containing greater than 1 ppm PCBs will be removed, and disposed of in a U.S. EPA approved off-site facility.

   - Groundwater monitoring will be conducted to confirm that no further soil removal is required.

2. Buildings and Equipment
   - Equipment and structure of the buildings, including concrete floors, will be cleaned, dismantled, and removed from the site for disposal at a U.S. EPA approved facility.

   - Soil underlying the building will be tested and if found to be contaminated above the recommended action levels, will be disposed at a U.S. EPA approved facility.

3. Site Grading
   - Site grading will include filling depressions to eliminate ponding, covering with sufficient topsoil, and providing and maintaining a vegetative cover to prevent erosion.

   - The fencing surrounding the site will be removed.

Declarations

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), the National Contingency Plan, and the Partial Consent Decree of September 12, 1984, and after consultation with the Illinois Attorney General and the Illinois Environmental Protection Agency, I have determined that the above remedy for the A & F Materials site effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare and the environment. Groundwater issues at this site will be addressed in a separate document.

I have also determined that the action being taken is a cost-effective alternative when compared to the other remedial options reviewed. In addition, the off-site transport, treatment, and secure disposition is more cost-effective than other remedial action alternatives considered and is necessary to protect public health, welfare and the environment.

Alan Levin (Acting)
Valdas V. Adamkus
Regional Administrator

June 14, 1985
Date

Attachments:

Summary of Remedial Alternative Selection
Community Relations Responsiveness Summary
Partial Consent Decree, dated September 12, 1984

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
A & F Materials Site, Greenup, Illinois

I. Site Location and Description

The A & F Materials site is located on three and three quarter acres of land on West Cumberland Street in Greenup, Illinois (Figure 1). The site is bounded by open farmland/woodland, the Village of Greenup wastewater treatment plant, and private residences (Figure 2).

Drainage from the site reaches the Embarras River by a ditch along the Illinois Central Railroad tracks. The site has a pronounced slope toward the Embarras River. The portion of the site outside of the facility fenceline is in the river's 100-year floodplain. The City of Newton occasionally withdraws drinking water from the Embarras River twenty-one miles downstream of the site. Geological information indicates that the site is underlain by sandy deposits associated with recent stream development. These alluvial sands overlie a sand and gravel deposit of glacial outwash origin. No drinking water or other production wells are located downgradient of the site. The drinking water supply for the Village of Greenup is separated from the site by the Embarras River which serves as a hydraulic barrier to any ground water flowing from the site. The site is located on a hillside which discharges runoff from rainfall directly onto the site.

II. Site History

The A & F Materials facility began operation in March 1977 and continued until it shut down in 1980. The operation processed waste materials (including, but not limited to oil, sludge, caustic and sulfuric acid) into fuel oil and fire retardant chemicals. During the course of operations, there were numerous violations of the permit issued to A & F Materials by the Illinois Enviromental Protection Agency. By March 1978, four storage lagoons became filled and began to overflow, contaminating soil and drainage pathways leading to the Embarras River. In addition, twelve steel storage tanks containing a mixture of waste oils (contaminated with PCBs and organics), sludges, spent caustics, spent acids, contaminated water and other waste products, were located on the site. The tanks had failed on several occasions, releasing their contents.

After the closure of the facility in 1980, the site was classified as an abandoned hazardous waste site under CERCLA. There have been numerous preliminary investigations and short-term removal actions sponsored by U.S. EPA and IEPA to secure the site and prevent the release of contaminants.

The A & F Material Company site was included on the proposed National Priorities List of December 1982. The site was ranked 62 out of an original total of 419. The December 1982 proposed list was made final in September 1983.

III. Current Site Status

In March 1980, May 1982, and December 1982, various actions were taken at the site to lower the immediate potential of releases. These actions included lowering the level of wastes in the lagoons, diking, trenching, cleanup and removal of on-site and off-site wastes. In addition, in March 1983 a temporary cap was placed on the consolidated sludge.

On September 12, 1984, a Partial Consent Decree, hereinafter the "First Consent Decree", was entered into by four companies, Aluminum Company of America, Northern Petrochemical, CAM-OR Inc. and Petrolite Corporation, hereinafter "Consenting Defendants". Under the terms of the Consent Decree, the Consenting Defendants agreed to undertake surface cleanup at the A & F Materials site as an additional removal action. As a part of the removal action, a total of 5,500 gallons of caustic waste and 4,000 gallons of PCB contaminated oil from the tanks, and 10,000 tons of soil/sludge from the lagoons have been removed from the site.

Pursuant to the First Consent Decree, an RI/FS was prepared by the Consenting Defendants which determined the amount of soil/sludge to be removed. Approximately 86% of this material, or 10,000 tons, has already been removed. The only soil/sludge remaining is approximately 1-2 feet of material covering the entire area of Area A and some material in the two lagoons (Figure 3). The amount of soil/sludge remaining on-site is estimated to be 1,600 tons.

The amount of soil contaminated with PCBs which contained levels of 1 ppm or greater was estimated to be 1,332 cubic yards (Figure 4). Area C has already been removed. In addition, a small area of soil located at the western edge of the building was found to contain high levels of contaminants, but no PCBs were detected.

The RI/FS determined that hazardous substances were used in the building and there is evidence of spills and residues remaining in the equipment and in the building. The building and equipment were not sampled due to the expense involved. Therefore, the RI/FS assumes that the building and equipment are contaminated with residues that are hazardous.

Existing geologic information indicates that the site is underlain by 3-21 feet of sandy alluvium over 2-26 feet of outwash sand and gravel. Prior to the removal actions already undertaken at the site, a major potential pathway for contaminant migration was surface runoff from the leaking tanks and overflow from the lagoons. Since the removal actions, the most significant pathway appears to be subsurface movement of contaminants which may be remaining in the ground water and from the contaminated soil.

IV. Federal Enforcement

A Federal lawsuit to bring about site cleanup at Greenup was initiated by the filing of a Complaint on September 3, 1980, pursuant to authority under the Resource Conservation and Recovery Act, 42 U.S.C. Sections 6901, 6973, and the Clean Water Act, 33 U.S.C. Sections 1251, 1311, 1319 and 1321. The Complaint alleged that the handling, treatment, storage and disposal of solid and hazardous wastes at the facility presented an imminent and substantial endangerment to health and the environment. The Complaint also cited the defendants for violation of Section 311(e) of the CWA, as evidenced by overflows from the pits. The original Complaint did not include generators as defendants.

Letters to all known generators, dated November 3, 1981, were sent by the Assistant U.S. Attorney requesting their participation in site cleanup. Demand letters to the generators for the required remedial action were sent by the Department of Justice on August 18, 1982. The generators were subsequently added to the lawsuit on February 14, 1983.

On September 12, 1984, the First Consent Decree was entered into by the Consenting Defendants. Under the terms of the First Consent Decree, the Consenting Defendants agreed to undertake a surface cleanup at the A & F Materials site as an additional removal action. This action consisted of emptying and disposing of the steel tanks, and emptying and disposing of the sludges and soils in the storage lagoons.

Additionally, the First Consent Decree provided for the Consenting Defendants to conduct an RI/FS, to reimburse the U.S. for any additional emergency response taken at the site, and to reimburse the U.S. for $340,000, and reimburse the State for $40,000. Subsequently, McDonnell-Douglas entered into a Partial Consent Decree (hereinafter the "Second Consent Decree") with the U.S. and the State, in which McDonnell-Douglas agreed to pay the U.S. $150,000 as reimbursement for past surface response costs at the site.

V. Alternatives Evaluation

A. Soils/Sediments

In the RI/FS conducted by the Consenting Defendants, several technologies were screened and eliminated. These included containment, diversion and grading, solidification, insitu treatment, and no action. The no action alternative was eliminated because it does not address the issue of existing contamination on site. Some action is considered necessary to remove this contamination and the threat to human health, welfare and the environment. Two alternatives were analyzed in detail: 1) partial removal with subsequent disposal at a secure off-site facility, and 2) complete removal of contaminated soils/sediments above background with subsequent disposal at a U.S. EPA approved facility. The costs of all the evaluated alternatives are shown in Table 1.

1) Partial Removal

Partial removal would include removal of the four contaminated soil zones and any other areas with contaminants at levels of concern. This technology would be useful in conjunction with disposal at a U.S. EPA approved facility. The environmental and public health risks for this alternative are low.

2) Complete Removal

Complete removal would consist of removal of all contaminated soils and sediments. This technology would be used in conjunction with disposal at a U.S. EPA approved facility. The environmental and public health risks associated with this alternative would be low.

B. Building and Equipment

In the RI/FS, the no-action alternative, consisting of monitoring and analysis and site maintenance, was screened and eliminated for the building and equipment. The no-action alternative was eliminated because it does not address the issue of existing contamination on site. Some action is considered necessary to remove this contamination and the threat to human health, welfare and the environment. Three alternatives were analyzed in detail: 1) cleaning and complete removal, 2) decontamination and complete removal, and 3) cleaning/decontamination and partial removal.

1) Cleaning and Complete Removal

This option consists of cleaning using high temperature, high pressure equipment, dismantling of the equipment and the building including the concrete floors, and disposal at a U.S. EPA approved facility. Effluent from the cleaning process would be treated, tested and discharged in a manner approved by U.S. EPA. Soils beneath the building would be tested and, if contaminated, would be removed, and disposed of in a U.S. EPA approved facility.

2) Decontamination and Complete Removal

This alternative involves decontamination, with repeated use of high temperature and high pressure equipment, until the material is determined to be free of contamination. The building and

equipment as described above, would be disposed of in a manner approved by U.S. EPA. Contaminated water generated during decontamination would be treated, tested, and discharged in a manner approved by U.S. EPA.

3) Cleaning and Partial Removal

This alternative involves cleaning of the equipment and the structure of the building as described in Alternative 1, and disposal at a U.S. EPA approved facility. After the equipment and the building are removed from the site, the floors and foundation would be decontaminated. Core samples of the concrete would be collected to determine the effectiveness of the decontamination. If no contamination is found, the floors and foundation would remain. Contaminated water generated from this step would be treated, tested and discharged in a manner approved by U.S. EPA.

C. Surface Water

The surface water at this site is defined as the water in the Embarras River and in the unnamed drainage ditch near the west boundary of the site.

In the RI/FS, two alternatives were analyzed for surface water: 1) no action, and 2) continued monitoring and analysis.

VI. Recommended Alternatives

A. Soils and Sediments

Partial removal is the most cost-effective (least cost alternative that effectively mitigates and minimizes damage to human health, welfare and the environment) alternative for soil and is therefore the recommended option. This action will comply with the terms of the First Consent Decree by removing soils found to contain greater than the Action Levels shown in Table 2, and disposing of these soils in a U.S. EPA approved facility.

Off-site disposal of the soil is selected because it is the most cost-effective and because it is necessary to protect public health, welfare and the environment from risks created by further exposure to continued presence of the substances.

Figure 4 shows the three areas on the site excluding the lagoons, that were contaminated with greater than 1 ppm PCBs. The volume of soils to be excavated at each of these areas was calculated in the FS as follows:

Area A = 50 feet wide
100 feet long
4 feet deep

equals 20,000 ft^3 or 740 yd^3

Area B = 30 feet wide
50 feet long
4 feet deep

equals 6,000 ft^3 or 222 yd^3

Area C = 100 feet wide
100 feet long
1 feet deep

equals 10,000 ft^3 or 370 yd^3

The total amount of soil to be removed from the three areas is 36,000 ft^3 or 1,332 yd^3 as computed in the FS. Area C has already been removed.

In addition, the area along the western edge of the building was found to be contaminated with PNA compounds. These soils have also been removed and disposed of with the PCB contaminated soils (Figure 3).

The remainder of the site apparently contains various areas with de minimis levels of other compounds. De minimis levels are comparable to those found to occur naturally in the environment, and are below levels which would pose a threat to human health, welfare or the environment. Table 2 shows the background levels of the compounds of interest found in the soil and sediments at the A & F site, and the suggested action level for soil/sediment removal. Soils found to contain levels greater than those in Table 2 are recommended for disposal at a U.S. EPA approved facility. Remaining soils beneath the lagoons will also be removed to levels below those identified in Table 2.

In response to concerns expressed at the December 4, 1984 public meeting, additional soil samples were taken from two locations identified by local citizens. These samples were split with the Illinois Attorney General's (hereinafter "IAG") office.

The IAG analyzed for aliphatic hydrocarbons as well as for the contaminants of concern. Low levels of aliphatic hydrocarbons were found in the split samples. Because aliphatic hydrocarbons are not contaminants of concern, as shown in Table 2, the Consenting Defendants were not required to analyze for them. Aliphatic hydocarbons are compounds found in oil. However, based on review of these sampling results by the Centers for Disease Control, aliphatic hydrocarbons do not present a health threat at this site, particularly at the low levels found. Both the IAG and the responsible parties analyzed for the contaminants of concern and no concentrations above the action levels were found.

The Consenting Defendants will be required to confirm that hazardous substances above the action levels are not present in these two areas by conducting additional soil samples in these areas. The approximate locations of these samples are shown in Figure 5. Samples will be taken at each of these locations, at depths of 1-2 feet, 2-3 feet, and 3-4 feet, for the purpose of determining the areal and vertical extent of contamination, if any. These samples will be analyzed for the hazardous substances shown in Table 2. If hazardous substances above the action levels are found in these samples, the soil in these areas will be removed.

Comments received from State agencies and the public regarding soil removal included the suggestion that additional soil be removed both to reduce the flushing time of the remaining low levels of contamination, and to remove the aliphatic hydrocarbons. However, based on the determination that human health and the environment will be protected after soil removal to the recommended action levels, no further soil removal is required. The Centers for Disease Control concur with this determination. In order to confirm that no further soil removal is required, groundwater monitoring will be conducted. In addition, the Consenting Defendants will be required to implement further remedial action if deemed necessary by U.S. EPA. Additional details and requirements regarding groundwater remedies will be discussed in a separate document.

The sediment from the river and the ditch which was analyzed in the Remedial Investigation Report showed contaminant levels well below the suggested action levels. Thus, it is not recommended to remove and dispose of sediments from the drainage pathways at this time.

B. Building and Equipment

The recommended remedial action for the building and equipment

is cleaning and complete removal. This action is the most cost-effective because it is assumed, in the absence of sampling data, that the building and equipment are contaminated with hazardous substances. Sampling of the building and equipment was not conducted due to the expense involved. Under this alternative, the equipment and structure of the building would be cleaned, dismantled and removed from the site for disposal in a U.S. EPA approved facility. Rinsate from the cleaning process will be treated, tested and discharged in a manner approved by U.S. EPA. Concrete floors and the foundation will also be removed and taken to a U.S. EPA approved facility. Soil samples will be taken from below the south and northwest ends of the building and analyzed to determine if contamination exists. Soil action levels will be used to determine if soil beneath the building would need to be excavated and disposed off-site.

Off-site disposal of the building and equipment is selected because it is the most cost-effective and because it is necessary to protect public health, welfare and the environment from risks created by further exposure to continued presence of the substances.

C. Surface Water

Based on the analyses of samples collected during the remedial investigation indicating that surface water is not contaminated, additional monitoring is not required. Removal of contaminated soil, site grading and vegetation will remove the potential for contamination of surface water. Therefore, no action is recommended for surface waters.

D. Site Grading

Final site grading will be performed for the entire A & F Materials Company site, as specified in the First Consent Decree. This will include filling depressions to eliminate ponding, covering with sufficient topsoil, and providing a vegetative cover to prevent erosion. Areas outside the existing fenceline will not be covered with topsoil because soil samples taken off-site did not show significant levels of contaminants of concern. The fencing will be removed.

After site vegetation, the site will be maintained for three years to prevent erosion, after which time the Consenting Defendants may petition U.S. EPA and the State to cease site maintenance.

The cost associated with the recommended alternatives for the soil/sediments, building and equipment, and site grading are shown in Table 4.

VII. Action Levels

The recommended action levels for soils and sediments at the A & F Materials site are shown in Table 2. These action levels correspond to the highest concentrations of contaminants presently remaining in soils outside of the fenceline of the site and were proposed in the RI/FS by the Consenting Defendants as levels which would provide adequate protection of human health, welfare and the environment and require no further action. These levels have been reviewed by U.S. EPA, and we agree with this conclusion. The levels for toluene and trichloroethylene were adjusted downward. No trichloroethylene was found outside of the lagoons above the required detection limits. The only toluene remaining is at the bottom of the lagoons. Adopting these action levels means that no soil outside the existing fenceline needs to be removed. Soils within the fenceline above these levels will be removed to a secure off site disposal facility. These levels represent the highest levels of contaminants that will remain in the soil at the facility.

As part of the remedial investigation, soil samples were collected outside of the area which could have been potentially impacted by releases from the facility. These results are generally shown as "background" levels on Table 2. However, samples of the waste materials in the lagoons and tanks have shown levels of chromium, cadmium, zinc and iron to be less then the "background" levels originally derived in the feasibility study. The "background" levels for these compounds have been revised to reflect that the levels in soils outside of the fenceline which are higher than the levels found in the waste are actually "background". These levels are not significantly higher than the previous "background" levels listed in the feasibility study. Also shown on Table 2 is a range of elemental concentrations in soils for certain metals compiled by the Centers for Disease Control (CDC). The "background" levels for all of the metals except zinc fall within these ranges.

The level of 2700 ppm zinc is a probable anomaly. This value occurred at a sample from a 1-2 foot depth at a sampling location 1700 feet from the nearest lagoon. A surface sample collected at the same location showed 65 ppm zinc. Samples taken at four adjacent sampling locations averaged 188 ppm zinc, well within the range of normal elemental concentrations of zinc.

The action levels for trichloroethylene, benzene, PCBs, phenols, dicyclopentadiene and PAH compounds are at, or below, the standard detection limits of the analytical methods used to quantify these compounds by U.S. EPA, and are therefore appropriate for use as action levels at this site.

The only action level listed in Table 2 which appears to be above "background", the detection limit, or levels which would be expected to occur at similar locations in the undisturbed environment, is for toluene. Using an analytical approach developed by CDC, U.S. EPA and CDC have evaluated compounds in Table 2 for their direct contact, inhalation and direct ingestion health effects. This would include children, or others who might play on, or otherwise come into contact with the site. None of the compounds present a health threat at the action levels shown.

Toluene was also evaluated for its potential effects on ground water, should toluene be released from the soil into the ground water. Using conservative assumptions for the release rate and mixing within the ground water regime, toluene will not cause ground water to be elevated above those levels which would be fully protective of human health, welfare and the environment. Table 3 shows the concentration of toluene in the soil, applicable groundwater quality criteria and the required mixing to insure that the release of toluene to ground water does not cause unacceptable levels. The required mixing factor is the action level in soil divided by the applicable water quality criteria. Since the required mixing factor is available at the site, and since there are no human receptors using the ground water at this time, no adverse impact of these compounds on ground water is expected due to releases from the soils which will remain at the site.

However, soil removal to those action levels shown in Table 2 will be confirmed by ground water monitoring. As discussed previously, at a minimum, ground water monitoring will be required to insure that ground water contamination will not occur due to these soils. Further remedial action will be required if so indicated by further ground water monitoring. Details regarding the ground water remedy and applicable ground water quality criteria will be presented in a separate document.

VIII. Consistency with the National Contingency Plan

The National Contingency Plan, 40 CFR Part 300.68(e)(2), states that source control remedial actions may be appropriate, if a substantial concentration of hazardous substances remain at or near the area where they were originally located, and inadequate barriers exist to retard migration of substances into the environment. Based upon analysis of the options, State and Federal environmental requirements, and the comments received from the public and the State, the recommended option option has been determined to the consistent with Section 300.68.

IX. Consistency with Other Environmental Laws

The proposed action will not require on-site treatment, storage, or disposal of hazardous wastes. Since all compounds will be removed to background, or the detection limit (except for toluene), the recommended action is fully consistent with RCRA. The level of toluene to remain will be fully protective of human health, welfare and the environment, and therefore is also consistent with RCRA. Although the materials to be removed are not hazardous wastes as regulated by RCRA, they are hazardous substances under CERCLA. The transportation and off-site disposal of wastes will be in accordance with the appropriate and relevant RCRA regulations for the transportation and disposal of hazardous wastes. This will include manifesting of wastes and shipment to a U.S. EPA approved facility.

Any on-site water treatment and discharge to surface waters will be in compliance with State of Illinois permit number 1984-EA-1265 and the substantive requirements of the Clean Water Act. Any necessary storm water permits will be obtained.

The recommended alternatives will minimize potential harm to the site, in accordance with Executive Order 11988, "Floodplain Management", and Executive Order 11990, "Protection of Wetlands". Although no potential impacts on the floodplain could be documented in the remedial investigation, and no further soil excavation will occur in the floodplain, the following measures will be implemented to minimize potential harm or adverse effects to the floodplain:

1. use minimum grading requirements;
2. return site to natural contours;
3. maintain vegetation;
4. regulate methods used for grading and filling;
5. require topsoil protection; and
6. no structures will be constructed in floodplain.

In accordance with the Toxic Substances Control Act, PCBs will be removed from the environment at the A & F Materials site to the lowest levels practicably attainable. This will mean removing all soils above 1 ppm and disposing of it in a U.S. EPA approved facility.

At this time, there are no implications for any other environmental laws.

X. Operation and Maintenance

The Consenting Defendants are required to submit an operation and maintenance plan to be approved by U.S. EPA. U.S. EPA will require that the Consenting Defendants implement the approved plan.

XI. Community Relations/Responsiveness Summary

Illinois EPA (IEPA) conducted an extensive community relations program which included several informal meetings in the homes of nearby residents, written updates, and frequent conversations with interested citizens, press, and local officials. The State, with U.S. EPA support, responded to their concerns. Public meetings, one of which was attended by staff from the Centers for Disease Control, were also held by IEPA and U.S. EPA at several times during the RI/FS process.

When the First Consent Decree was filed in June 1984, U.S. EPA assumed the lead on community relations, although the State maintained an active cooperative role. Several public comment periods have been held, accompanied by public meetings, briefings, and other notification of interested parties. A five-week public comment period was available for the FS upon which this record is based.

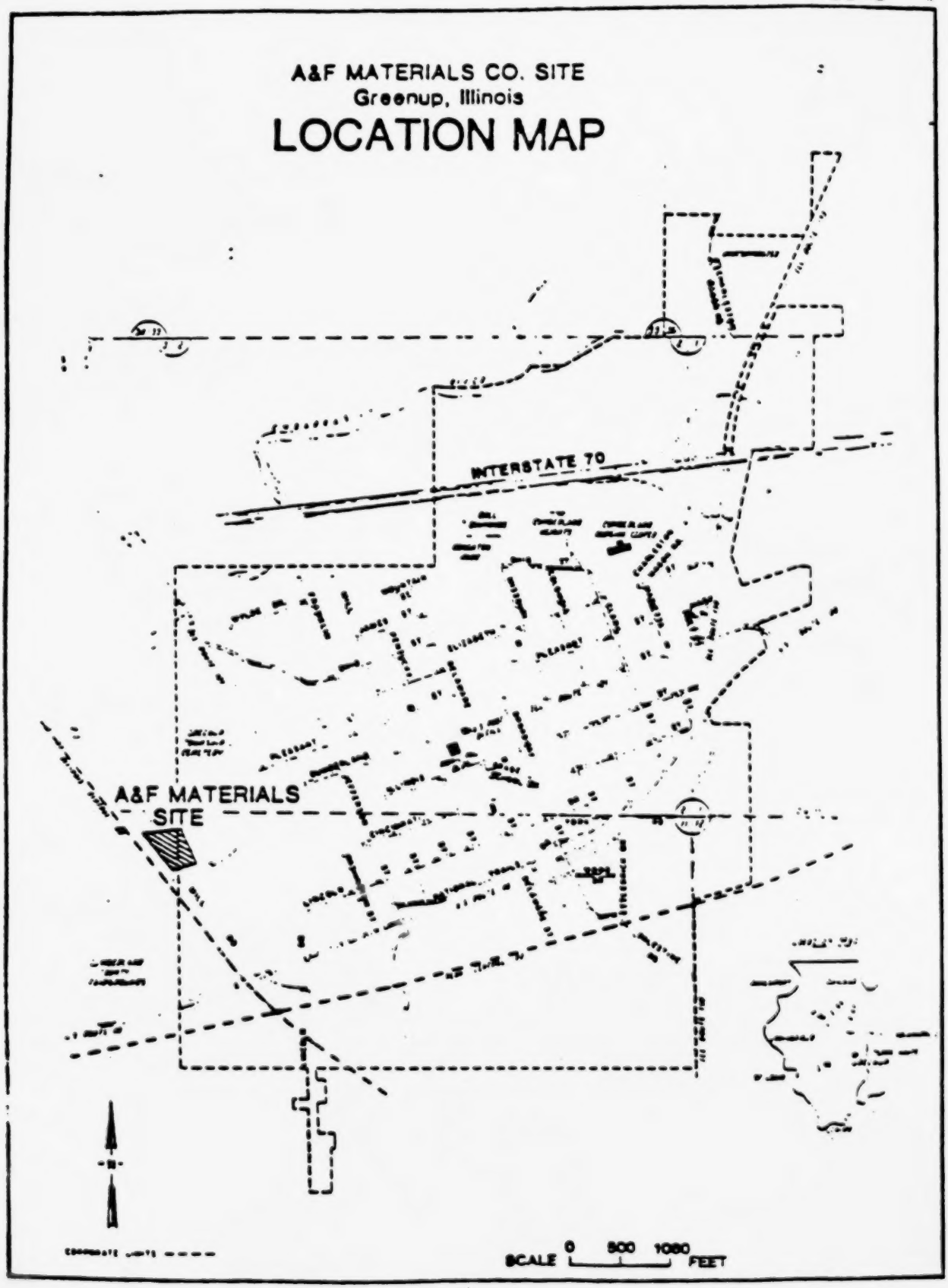
There was some dissatisfaction among the public during the final months of the negotiations as some individuals apparently believed that they were unable to obtain feedback or response to their questions. However, they are pleased with what has been accomplished and the promptness of action once the First Consent Decree was signed. Information supplied by nearby residents has been useful in discovering the full nature of the contamination and is reflected in the recommendations for the site.

The responsiveness summary is attached.

XII. Deletion from the NPL

Implementation of the recommended alternative, in connection with a ground water remedy (to be discussed in a separate document), is expected to allow the site to be deleted from the NPL.

FIGURE 1


A&F MATERIALS CO. SITE
Greenup, Illinois
LOCATION MAP
INTERSTATE 70
A&F MATERIALS SITE
SCALE 0 500 1000 FEET

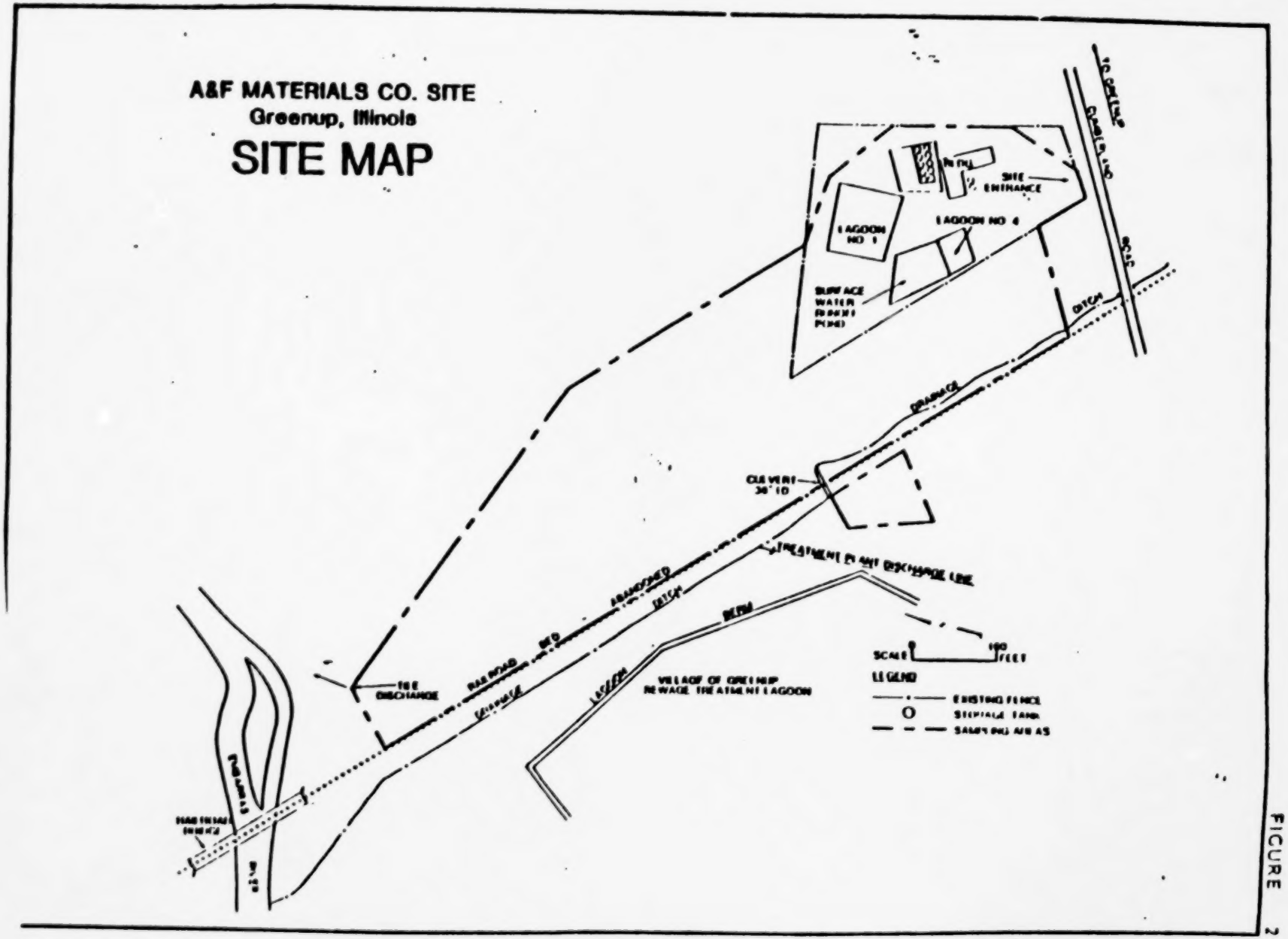

A&F MATERIALS CO. SITE
Greenup, Illinois
SITE MAP
SITE ENTRANCE
LAGOON NO 1
LAGOON NO 4
SURFACE WATER RUNOFF POND
DITCH
DRAINAGE
CULVERT 36" ID
TREATMENT PLANT DISCHARGE LINE
ABANDONED RAILROAD BED
DITCH
BERM
TEE DISCHARGE
RAILROAD BED
DRAINAGE
VILLAGE OF GREENUP SEWAGE TREATMENT LAGOON
SCALE
100 FEET
LEGEND
EXISTING FENCE
SEPTAGE TANK
SAMPLING AREAS

FIGURE 2

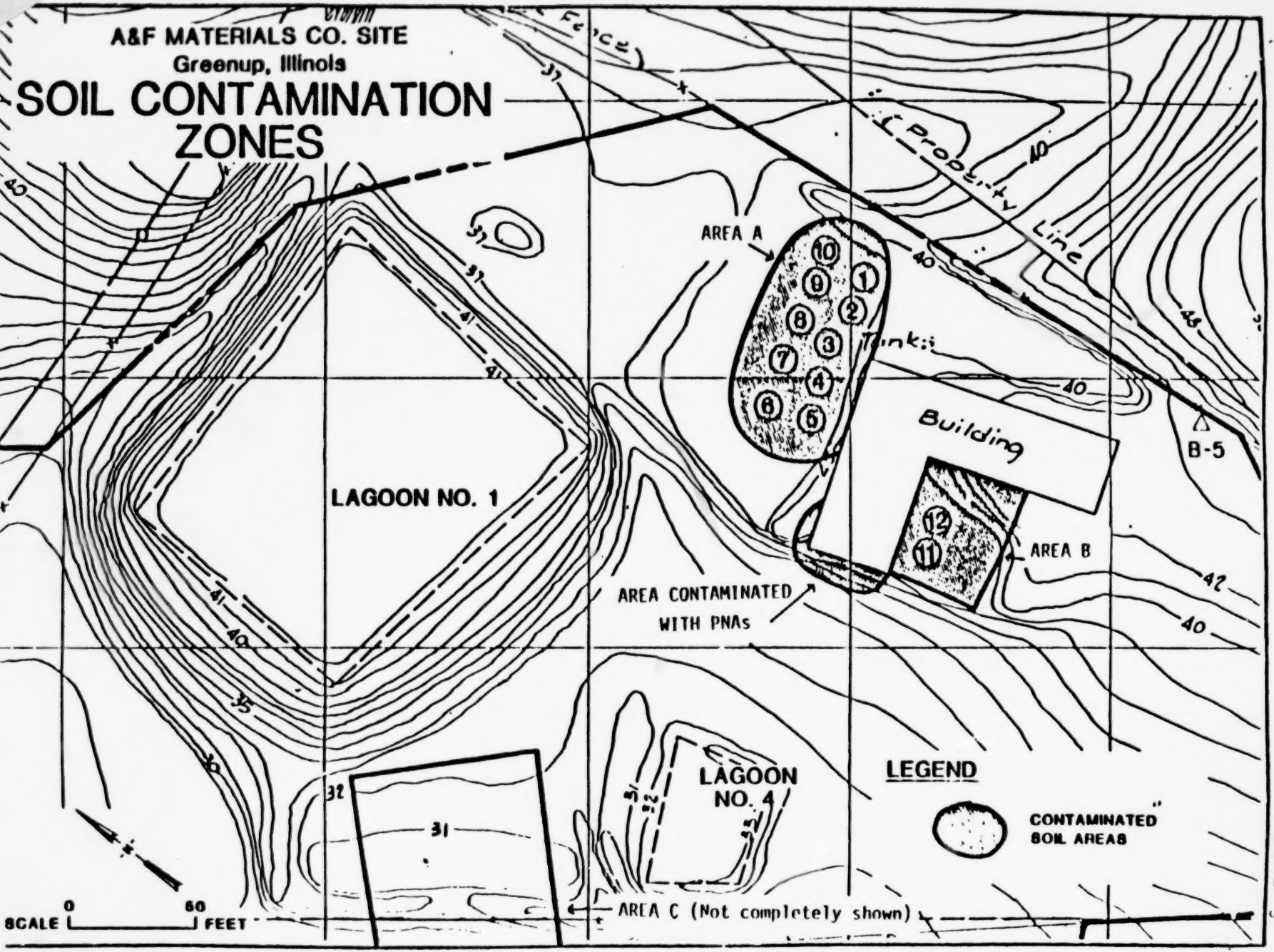

A&F MATERIALS CO. SITE
Greenup, Illinois
SOIL CONTAMINATION ZONES
Property Line
AREA A
Tanks
Building
B-5
LAGOON NO. 1
AREA B
AREA CONTAMINATED WITH PNAs
LAGOON NO. 4
LEGEND
CONTAMINATED SOIL AREAS
AREA C (Not completely shown)
SCALE 0 60 FEET

FIGURE 3

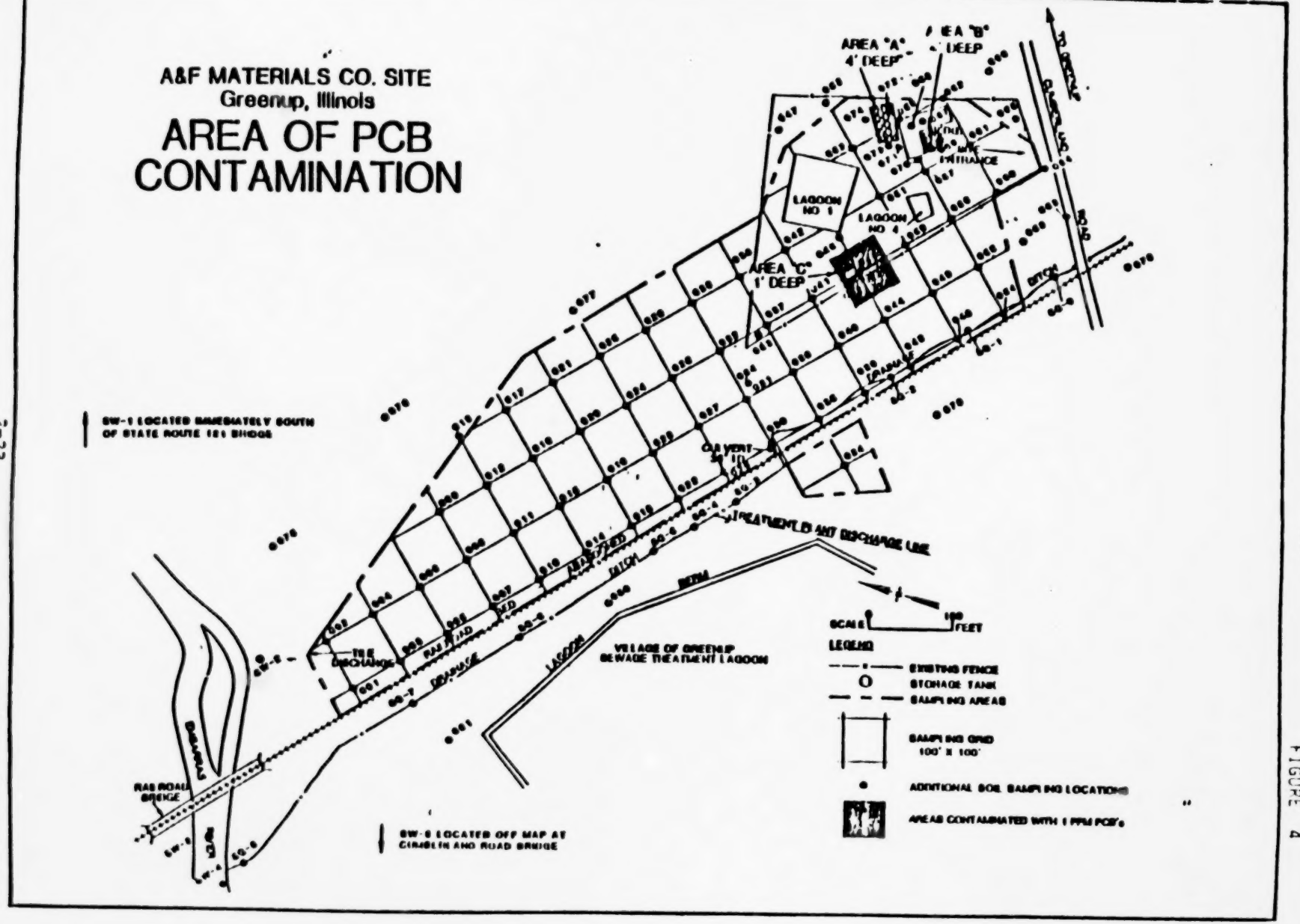

A&F MATERIALS CO. SITE
Greenup, Illinois
AREA OF PCB CONTAMINATION
AREA "A" 4' DEEP
AREA "B" 1' DEEP
AREA "C" 1' DEEP
LAGOON NO 1
LAGOON NO 4
ENTRANCE
DITCH
CULVERT
TREATMENT PLANT DISCHARGE LINE
VILLAGE OF GREENUP SEWAGE TREATMENT LAGOON
RAILROAD BRIDGE
SW-1 LOCATED IMMEDIATELY SOUTH OF STATE ROUTE 161 BRIDGE
SW-8 LOCATED OFF MAP AT GIRARLIN AND ROAD BRIDGE
SCALE 100 FEET
LEGEND
EXISTING FENCE
STORAGE TANK
SAMPLING AREAS
SAMPLING GRID 100' X 100'
ADDITIONAL SOIL SAMPLING LOCATIONS
AREAS CONTAMINATED WITH 1 PPM PCB's

FIGURE 4

A&F MATERIALS CO. SITE
Greenup, Illinois

SUPPLEMENTAL SOIL SAMPLING LOCATIONS

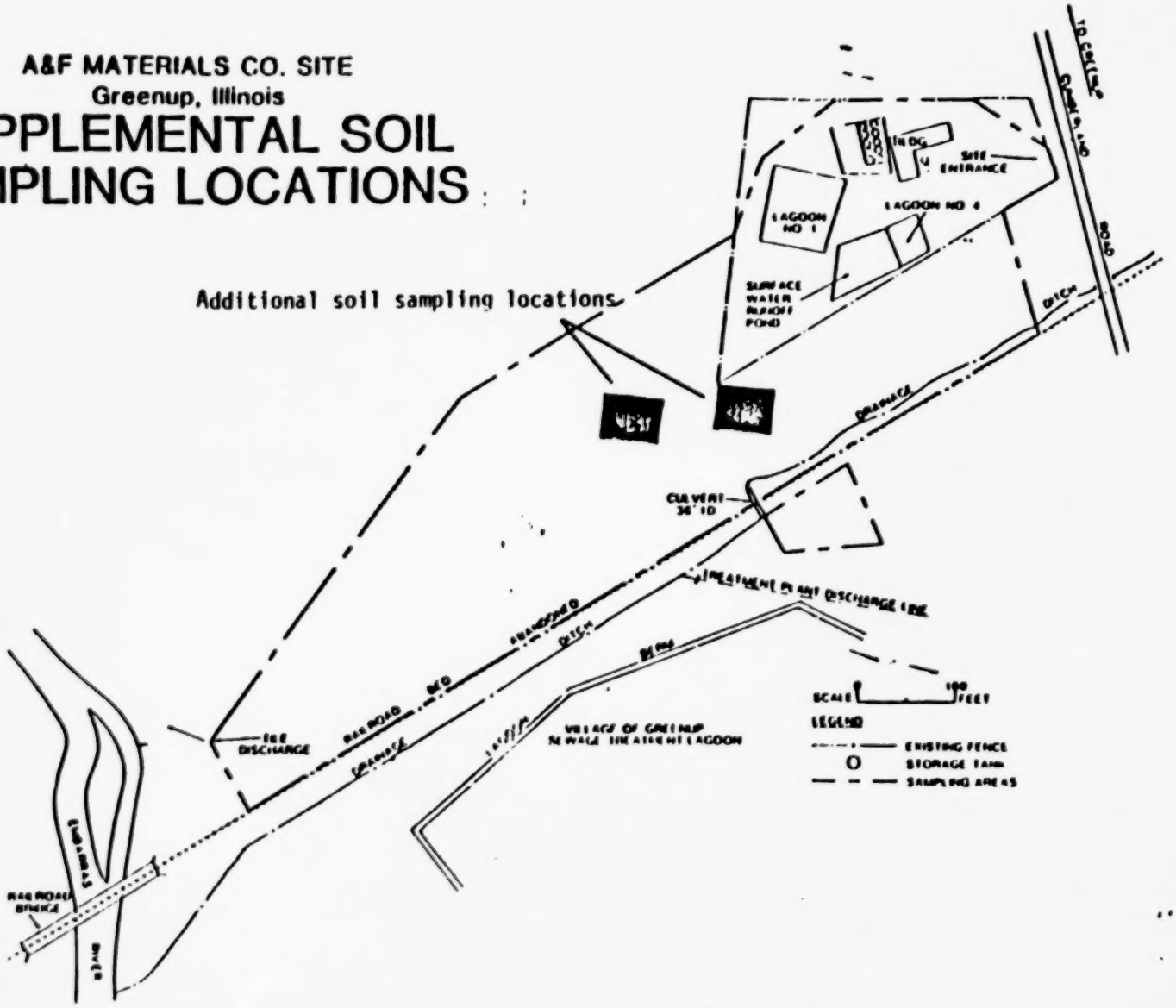


FIGURE 5

Table 1

Cost of Remedial Alternatives

A & F Materials Site

Alternative	Cost	Comments
1) Soils and Sediments - Partial Removal	$ 660,000	Includes excavation, transportation, disposal and analytical costs.
- Complete Removal	$1,735,000	Includes excavation, transportation, and disposal; also the construction efforts to remove and solidify sediments.
2) Building and Equipment - Cleaning and Complete Removal	$ 120,000	Includes the costs of decontamination of the equipment and building, collection and treatment of rinsate, sampling and analysis, and disposal at a U.S. EPA approved facility.
- Decontamination and Complete Removal	$ 120,000	Same as above, except increased costs of decontamination of the equipment and building, collection and treatment of rinsate, and sampling and analysis; decreased costs for disposal.
- Cleaning and Partial Removal	$ 96,000	Includes decontamination, treatment of rinsate, collection and analysis of samples of the concrete, and disposal at a U.S. EPA approved facility.

TABLE 2

SOIL AND SEDIMENT CONTAMINANT LEVELS

Compounds	Background Soil Level (ug/gm)	Recommended Soil Action Levels (ug/gm)	Background Sediment Levels (ug/gm)	Recommended Sediment Action Levels (ug/gm)	Meduim Elemental Concentrations in Soil (ug/gm) Medium	Range
Benzene	<1	1.0	<1	1.0		
Toluene	<1	12.0	<1	12.0		
Trichloroethylene	<1	1.0	<1	1.0		
PCB	<1	1	<1	1		
Phenols	<10	10	0.38	10		
Dicyclopentadiene	<1	1.0	1	1		
Fluoranthene	<10	1.0	0.47	2.0		
Benzo(a)anthracene	<10	1.5	0.21	2.0		
Chrysene	<10	1.0	0.2	2.0		
Pyrene	<10	1.0	0.64	2.0		
Phenanthrene	<10	1.0	0.28	2.0		
Acenaphthalene	<10	1.0	<10	2.0		
Benzo(a)pyrene	<10	0.5	<10	2.0		
Benzo(ghi)pyrene	<10	0.5	<10	2.0		
Indeno(1,2,3-cd)pyrene	<10	0.5	<10	2.0		
Benzo(b)or(k)fluoranthene	<10	3.5	<10	2.0		
Anthracene	<10	1.0	0.9	2.0		
Naphthalene	<10	2.0	0.33	2.0		
Flourene	<10	1.0	<10	2.0		
Lead	46	160	53	100	29	1-888
Chromium	80	80	12	40	100	5-3,000
Cadmium	5	5	1.6	3	.5	.01-7
Aluminum	30,000	30,000	2,012	15,000	71,000	10,000-300,000
Zinc	2,700	2,700	102	300	90	1-2,000
Iron	65,000	65,000	9,157	30,000	40,000	100-550,000

TABLE 4

COST OF RECOMMENDED ALTERNATIVES
A & F MATERIALS SITE

Recommended Alternative	Cost	Comments
1) Soils and Sediments - Partial Removal	$660,000	Includes excavation, transportation, disposal and analytical costs. The volume to be excavated is estimated to be 6,000 yd^3.
2) Building and Equipment -Cleaning and complete removal	$120,000	Includes the costs of decontamination of the equipment and building, collection and treatment of rinsate, sampling and analysis, and disposal at a U.S. EPA aspproved facility.
3) Site grading	$44,000	Includes costs for filling depressions to eliminate ponding, covering with topsoil, and providing a vegetative cover to prevent erosion. This will be done for the entire A & F Materials site.

Section 1

PURPOSE OF THIS RESPONSIVENESS SUMMARY

This document has two purposes. The first is to report verbal and written comments on the various remedial actions suggested for the A&F Materials hazardous waste site. The second is to document U.S.EPA's responses to these comments. The remedial action options, including a recommended alternative, were outlined in a draft Feasibility Study (FS) which was completed in October 1984. A revised FS was submitted on January 18, 1985.

Section 2

FEASIBILITY STUDY OVERVIEW

SITE BACKGROUND AND HISTORY

In 1977, the A&F Materials company began recycling industrial waste materials--oils, sludge, caustic and sulfuric acids-- into fuel oil and fire retardant chemcals.

The Illinois Environmental Protection Agency (IEPA) received complaints about the recycling facility soon after it started operations. IEPA investigated and found the company violating numerous permit regulations. The facility was shut down and abandoned in 1980. Waste materials were left in storage tanks, lagoons, and in the processing equipment.

As part of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the waste generators who had stored their materials at the A&F site were required to clean up the site themselves and/or reimburse the state and federal governments for any government cleanup actions.

Several containment actions were taken by IEPA and U.S.EPA to prevent migration of contaminants into the Embarras River. A consent order was finalized after a public comment period in June 1984. In it four companies--Aluminum Company of America (ALCOA), Northern Petrochemical, CAM-OR Inc., and Petrolite Corporation -- agreed as part of a partial consent decree with U.S.EPA and IEPA to do a complete surface cleanup. These four companies (Consenting Defendants) are not the only responsible waste generators; they are the firms that have consented to undertake the cleanup. The cleanup, which the four companies paid for themselves, is scheduled to be finished in August 1985.

CLEANUP ACTIVITIES

All sludge and visibly contaminated soils from the lagoons have been taken offsite for disposal. All liquid material from the tanks has been either treated onsite or disposed of offsite. The tanks were cleaned and removed from the site. Contaminated soil areas outside of the lagoons were also excavated and disposed of offsite. The FS was needed to determine the best course of corrective action for the remaining contaminated soils.

FS SUMMARY

The FS prepared by the Consenting Defendants recommended continued monitoring of groundwater. No other actions for groundwater were deemed necessary because no groundwater wells are affected by the site and, therefore, no health risks can be currently attributed to groundwater. Furthermore, the high costs for operation and maintenance of groundwater treatment systems do not appear to be justified.

The Remedial Investigation (RI) determined that the aquifer underneath the site is flushed naturally every 10 to 15 years. The RI predicted that contaminant levels would remain near their present values for a two to four year period and would then decline. A program of groundwater monitoring would verify or dispute these predictions.

The FS prepared by the Consenting Defendants recommended "Alternative A", the partial soil removal option, for dealing with remaining soil contamination. According to Alternative A, soils in the four most contaminated areas would be removed and transported to a U.S.EPA approved facility. Soils found to contain greater than 1 part per million (ppm) of PCBs would also be removed and disposed of offsite.

The remaining soils and sediments contain low levels of polynuclear aromatic hydrocarbons (PNAs). Levels are comparable to concentrations found naturally in the environment and do not present environmental or public health risks.

The FS also set various guidelines called action levels that will guide soil removal activities. Soil that has concentrations at or higher than these action levels will be disposed of offsite at a U.S. EPA approved facility.

The sediment data in the RI showed concentrations well below the suggested action levels. Therefore, sediment will not be removed.

All buildings and equipment onsite will be removed and disposed of offsite. The concrete foundation will also be removed and soil underneath will be sampled to determine if any contamination exists there.

PUBLIC COMMENTS/U.S.EPA RESPONSES

The draft A&F Feasibility Study was issued in October 1984. A public meeting was held on December 4, 1984, in the Town of Greenup, Illinois. A three week comment period followed. It was extended an additional two weeks to enable the public to more closely study the document. A final FS was submitted to U.S. EPA on January 18, 1985.

The verbal and written comments can be divided into the following categories:

- Soil and sediment
- Buildings and equipment
- Groundwater

Comments that required a response by U.S.EPA are summarized in this section. Public comments are edited and sometimes paraphrased so similar comments can be combined. The intent has been to present the full range of topics without lengthy repetition. Groundwater issues will be addressed in a separate document.

SOIL AND SEDIMENT

Comment:

"The RI/FS missed widespread areas of soil contamination because of errors in the soil sampling program. A 1980 remedial action covered up contaminated soil offsite with clean soil from a nearby hillside. The RI/FS sampling program failed to sample and analyze this contaminated soil below the hillside."

U.S. EPA Response:

Originally, three areas of highly contaminated soils were found onsite. They are called "highly contaminated" because they contained contaminants at levels that were significantly above levels normally found in the environment. These highly contaminated areas were in the two tank farms and around the western edge of the processing section of the building. Additionally, a small area of soil contaminated with 1 ppm of PCBs west of lagoon 1 was identified. Soils in all of these areas have been or will be removed from the site and disposed of offsite at a U.S.EPA approved facility.

There were several areas of lightly contaminated soils found generally west of the waste lagoons. The term "lightly contaminated" refers to soil that contains low levels or traces of contaminants that have no health or environmental concerns associated with them. In other words, lightly contaminated areas have concentrations of chemicals that might naturally occur in the environment.

In 1980, 1 foot of soil was removed from the west part of the site and covered with clean soil. Samples for the RI/FS were taken in that area, including samples at depths of one to two feet, that would pick up any contamination under the clean soil. The Consenting Defendants and the Illinois Attorney General's office also resampled the soil in December 1984 to depths of 4 feet. Hazardous substances were not found in the new samples; however, aliphatic hydrocarbons were found at low levels. The Centers for Disease Control has reviewed these results and found no health problem. The Consenting Defendants will be required to resample this area at various depths, up to 4 feet. If this area is contaminated with hazardous substances, the soil will be removed.

U.S. EPA, therefore, believes that samples were taken deep enough to find any existing contamination. U.S. EPA believes that the RI/FS sampling program was sufficient.

U.S. EPA believes there are no data to support that remaining soils present a threat to public health or the environment.

Comment:

Leaving soils may present odor problems, particularly in the summer months and during wet weather.

U.S.EPA Response:

Buried contaminated soil should not be an odor problem. There appears, however, to be an indication that decomposition of organic materials that produce methane and other odor-causing compounds, common in marshy areas, could present an occasional odor problem. In any event, according to the recommended alternative, the site will be graded, depressions will be filled to prevent ponding, and topsoil will be added. This may or may not affect possible odors from the site. The odor problem which was present at the site in the past will have been eliminated by the removal of the lagoons, tanks and highly contaminated soil from the surface of the site.

Comment:

Is the soil underneath the building foundation contaminated?

U.S. EPA Response:

When the foundation is removed, the soil will be sampled. If the soil is contaminated, it will be removed and disposed of offsite. The various action levels stated in the FS will determine whether the contamination levels in soils will justify their removal.

Comment:

U.S. EPA should make sure the topsoil between the site and the river is removed because groundwater flows through this area and could then become contaminated.

U.S. EPA Response:

The soil in the field does not contain levels of contaminants that would present any threats to public health or the environment. Therefore, removing the soil in the field between the site and the river is not necessary.

Comment:

One letter said that "black yuck" was dumped on the field between the river and the site and that no crops grew there until clean dirt was put there.

U.S. EPA Response:

The soil in this area was removed and placed west of the fenceline in 1980. The area has been sampled to depths of 4 feet. No contamination was found. Toluene at 0.8 parts per million (ppm) was found, but such levels do not pose health or environmental threats. (U.S.EPA water quality criteria state that 35 ppm is the level that would present environmental threats. In addition, levels of toxic chemcials in soil can be orders of magnitude higher than the levels in groundwater before they become health threats.)

Comment:

Sediment in the drainage ditch should be removed.

U.S. EPA Response:

The suggested action levels do not pose a threat to biota. Therefore, sediment removal and disposal is not recommended at this time.

BUILDINGS AND EQUIPMENT

Comment:

Buildings should be completely removed because therre is always the risk that sampling might have missed some contamination.

U.S. EPA Response:

The building and its foundation and all equipment will be removed and disposed of offsite. Soil under the building foundation will be sampled and if there is any contaminated soil or other materials found tney will be removed.

MISCELLANEOUS

Many letters and verbal comments expressed concern and a desire for a total cleanup. Many letters said the site should be returned to the same condition it was bedore A&F Materials began operations.

U.S. EPA wholeheartedly agrees that the site should be left in a condition in which it presents no danger to the public and the environment. The Agency believes that the recommended alternative accomplishes this goal.

ATTACHMENT 2

Post-Cleanup Soil Analysis Results

WADSWORTH/ALERT
LABORATORIES, INC.
Sampling testing
consulting mobile labs

HEADQUARTERS AND
LABORATORY
1600 Fourth Street S E
P O Box 208
Canton OH 44701
(216) 454 5809

LABORATORY
2121 Fourth Street S E
Canton OH 44701
(216) 454-1703

SOUTHEASTERN
REGIONAL OFFICE
744 Sunset Boulevard
West Columbia SC 29169
(803) 794-6251

REGIONAL
LABORATORY
Route 3 - Box 235
Bartow FL 33830
(813) 533-2150
(Shipping address)
Avenue D North
Bartow Municipal Airport
Bartow FL 33830

24-Hour ALERT line
(216) 454-8304
In Ohio Call
800-544-5588

ANALYTICAL REPORT

LAGOON #1 and #4

Engineering Science
Atlanta, Georgia

Presented to:
Susan Minicucci

ALERT, INC.

Marvin W. Stephens

Marvin W. Stephens, Ph.D.
Vice President & Technical Director

September 24, 1985

ALERT, INC.

INTRODUCTION

This report includes the analytical results for soil samples submitted by Engineering Science. The individual report sheets detail the analytical parameters and results for each sample. As requested only the samples nearest the surface were analyzed initially. Since only very low levels of contamination were detected in one of the samples and none in the other, no analyses were performed on samples at greater depths.

All analyses were performed in accordance with the USEPA Manual SW 846.

WADSWORTH/ALERT
LABORATORIES, INC.

ALERT, INC.

PCB COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #4 Top
Laboratory Identification: 91102
Sample Matrix: Soil

Date rec'd : 9/10/85
Date extracted: 9/10/85
Date analyzed: 9/12/85

PCB-1016	ND	PCB-1248	ND
PCB-1221	ND	PCB-1254	ND
PCB-1232	ND	PCB-1260	ND
PCB-1242	ND		

Note: ND (None detected, lower detectable limit = 1 ug/g)

WADSWORTH/ALERT
LABORATORIES, INC.

ALERT, INC.

POLYNUCLEAR AROMATIC HYDROCARBONS REPORT SHEET

Company: Engineering Science
Sample Identification: Lagoon #4 Top
Laboratory Identification: 91102

Date rec'd: 9/10/85
Date extracted: 9/10/85
Date analyzed: 9/12/85

Acenaphthene	ND	Chrysene	ND
Acenaphthylene	ND	Dibenzo(a,h)anthracene	ND
Anthracene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(a)anthracene	ND	Fluoranthene	ND
Benzo(b)fluoranthene	ND	Fluorene	ND
Benzo(k)fluoranthene	ND	Indeno(1,2,3-cd)pyrene	ND
Benzo(ghi)perylene	ND	Naphthalene	ND
Benzo(a)pyrene	ND	Phenanthrene	ND
2-Chloronaphthalene	ND	Pyrene	ND

ND (None detected, lower detectable limit = 1 ug/g)
ND* (None detected, lower detectable limit = 5 ug/g)

WADSWORTH/ALERT
LABORATORIES, INC.

ALERT, INC.

ACID COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #4 Down 1'
Laboratory Identification: 91103
Sample Matrix: Soil

Date rec'd: 9/10/85
Date extracted:
Date analyzed:

ANALYSIS NOT REQUIRED

WADSWORTH/ALERT
LABORATORIES, INC.
Sampling testing
consulting mobile labs

HEADQUARTERS AND
LABORATORY
1600 Fourth Street S E
P O Box 208
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ORGANIC ANALYTICAL REPORT

ALCOA, GREENUP, ILL. PROJECT

PRESENTED TO:

Engineering Science

Susan Minicucci

ALERT, INC.

Marvin W. Stephens, Ph.D.
Vice President & Technical Director

September 12, 1985

ALERT, INC.

INTRODUCTION

This report includes the analytical results for two soil samples submitted by Engineering Science from the Alcoa, Greenup, Ill. site. The samples were analyzed for phenols, base/neutral extractables (includes PNA's), and polychlorinated biphenyls (PCB's). USEPA Methods 625 and 608, respectively, were used in the analyses. The samples were included in the comprehensive laboratory QA/QC program included with this report.

Both samples showed low level concentrations of phenols. However, no other requested compounds were detected.

WADSWORTH/ALERT
LABORATORIES, INC.

ALERT, INC.

ACID COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Tank Farm
Laboratory Identification: 91016
Sample Matrix: Soil

Date rec'd: 9/6/85
Date extracted: 9/8/85
Date analyzed: 9/9/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	0.9 J
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*		
2-Methyl-4,6-dinitrophenol	ND*		
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 1 ug/g)
ND * (None detected, lower detectable limit = 5 ug/g)
J (Estimated value, below detectable limit)

ALERT, INC.

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Tank Farm
Laboratory Identification: 91016
Sample Matrix: Soil

Date rec'd: 9/6/85
Date extracted: 9/8/85
Date analyzed: 9/9/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Acothracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	Fluoranthene	ND
Benzo(k)fluoranthene	ND	Fluorene	ND
Benzo(ghi)perylene	ND	Hexachlorobenzene	ND
Benzo(a)pyrene	ND	Hexachlorobutadiene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachloroethane	ND
Bis(2-chloroisopropyl)ether	ND	Indeno(1,2,3-cd)pyrene	ND
Bis(2-ethylhexyl)phthalate	ND	Isophorone	ND
4-Bromophenyl phenyl ether	ND	Naphthalene	ND
Butyl benzyl phthalate	ND	Nitrobenzene	ND
2-Chloronaphthalene	ND	N-Nitrosodimethylamine	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodiphenylamine	ND
Chrysene	ND	N-Nitrosodi-n-propylamine	ND
Dibenzo(a,h)anthracene	ND	Phenanthrene	ND
Di-n-butyl phthalate	ND	Pyrene	ND
1,2-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

ND (None detected, lower detectable limit = 1 ug/g)
ND* (None detected, lower detectable limit = 5 ug/g)

WADSWORTH/ALERT
LABORATORIES, INC.

ALERT, INC.

PCB COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Tank Farm
Laboratory Identification: 91016
Sample Matrix Soil

Date rec;d : 9/6/85
Date extracted: 9/8/85
Date analyzed: 9/9/85

PCB-1016	ND	PCB-1248	ND
PCB-1221	ND	PCB-1254	ND
PCB-1232	ND	PCB-1260	ND
PCB-1242	ND		

Note: ND (None detected, lower detectable limit = 1 ug/g)

WADSWORTH/ALERT
LABORATORIES, INC.

ALERT, INC.

ACID COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #1
Laboratory Identification: 91017
Sample Matrix: Soil

Date rec'd: 9/6/85
Date extracted: 9/8/85
Date analyzed: 9/9/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	14 ug/g
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*	Others:	
2-Methyl-4,6-dinitrophenol	ND*	4-Methyl phenol (p-Cresol)	3.5 ug/g
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 1 ug/g)
ND * (None detected, lower detectable limit = 5 ug/g)

ALERT, INC.

PCB COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #1
Laboratory Identification: 91017
Sample Matrix Soil

Date rec'd : 9/6/85
Date extracted: 9/8/85
Date analyzed: 9/9/85

PCB-1016	ND	PCB-1248	ND
PCB-1221	ND	PCB-1254	ND
PCB-1232	ND	PCB-1260	ND
PCB-1242	ND		

Note: ND (None detected, lower detectable limit = 1 ug/g)

WADSWORTH/ALERT
LABORATORIES, INC.

ALERT, INC.

BASE/NEUTRAL COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #1
Laboratory Identification: 91017
Sample Matrix: Soil

Date rec'd: 9/6/85
Date extracted: 9/9/85
Date analyzed: 9/9/85

Acenaphthene	ND	Diethyl phthalate	ND
Acenaphthylene	ND	Dimethyl phthalate	ND
Anthracene	ND	2,4-Dinitrotoluene	ND
Benzidine	ND*	2,6-Dinitrotoluene	ND
Benzo(a)anthracene	ND	Di-n-octyl phthalate	ND
Benzo(b)fluoranthene	ND	Fluoranthene	ND
Benzo(k)fluoranthene	ND	Fluorene	ND
Benzo(ghi)perylene	ND	Hexachlorobenzene	ND
Benzo(a)pyrene	ND	Hexachlorobutadiene	ND
Bis(2-chloroethoxy)methane	ND	Hexachlorocyclopentadiene	ND
Bis(2-chloroethyl)ether	ND	Hexachloroethane	ND
Bis(2-chloroisopropyl)ether	ND	Indeno(1,2,3-cd)pyrene	ND
Bis(2-ethylhexyl)phthalate	ND	Isophorone	ND
4-Bromophenyl phenyl ether	ND	Naphthalene	ND
Butyl benzyl phthalate	ND	Nitrobenzene	ND
2-Chloronaphthalene	ND	N-Nitrosodimethylamine	ND
4-Chlorophenyl phenyl ether	ND	N-Nitrosodiphenylamine	ND
Chrysene	ND	N-Nitrosodi-n-propylamine	ND
Dibenzo(a,h)anthracene	ND	Phenanthrene	ND
Di-n-butyl phthalate	ND	Pyrene	ND
1,2-Dichlorobenzene	ND	1,2,4,Trichlorobenzene	ND
1,3-Dichlorobenzene	ND		
1,4-Dichlorobenzene	ND		
3,3'-Dichlorobenzidine	ND*		

ND (None detected, lower detectable limit = 1 ug/g)

ND* (None detected, lower detectable limit = 5 ug/g)

ATTACHMENT 3

Responsiveness Summary

Section 1

PURPOSE OF THIS RESPONSIVENESS SUMMARY

This document has two purposes. The first is to report verbal and written comments on the various remedial actions suggested for the A & F Materials hazardous waste site. The second is to document U.S. EPA's responses to these comments. The remedial action options, including a recommended alternative, were outlined in a draft Feasibility Study (FS) which was completed in October 1984. A revised FS was submitted on January 18, 1985.

Section 2

FEASIBILITY STUDY OVERVIEW

SITE BACKGROUND AND HISTORY

In 1977, the A & F Materials company began recycling industrial waste materials--oils, sludge, caustic and sulfuric acids-- into fuel oil and fire retardant chemcals.

The Illinois Environmental Protection Agency (IEPA) received complaints about the recycling facility soon after it started operations. IEPA investigated and found the company violating numerous permit regulations. The facility was shut down and abandoned in 1980. Waste materials were left in storage tanks, lagoons, and in the processing equipment.

As part of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the waste generators who had stored their materials at the A & F site were required to clean up the site themselves and/or reimburse the state and federal governments for any government cleanup actions.

Several containment actions were taken by IEPA and U.S. EPA to prevent migration of contaminants into the Embarras River. A consent order was finalized after a public comment period in June 1984. In it four companies--Aluminum Company of America (ALCOA), Northern Petrochemical, CAM-OR Inc., and Petrolite Corporation -- agreed as part of a partial consent decree with U.S. EPA and IEPA to do a complete surface cleanup. These four companies (Consenting Defendants) are not the only responsible waste generators; they are the firms that have consented to undertake the cleanup. The cleanup, which the four companies paid for themselves, was completed in September 1985.

CLEANUP ACTIVITIES

All sludge and visibly contaminated soils from the lagoons have been taken offsite for disposal. All liquid material from the tanks has been either treated onsite or disposed of offsite. The tanks were cleaned and removed from the site. Contaminated soil areas outside of the lagoons were also excavated and disposed of offsite. The FS was needed to determine the best course of corrective action for the remaining contaminated soils.

FS SUMMARY

The FS prepared by the Consenting Defendants recommended continued monitoring of groundwater. No other actions for groundwater were deemed necessary because no groundwater wells are affected by the site and, therefore, no health risks can be currently attributed to ground water. Furthermore, the high costs for operation and maintenance of ground water treatment systems do not appear to be justified.

The Remedial Investigation (RI) determined that the aquifer underneath the site is flushed naturally every 10 to 15 years. The RI predicted that contaminant levels would remain near their present values for a two to four year period and would then decline. A program of ground water monitoring would verify or dispute these predictions.

The FS prepared by the Consenting Defendants recommended "Alternative A", the partial soil removal option, for dealing with remaining soil contamination. In accordance with Alternative A, soils in the four most contaminated areas were removed and transported to a U.S. EPA approved facility. Soils found to contain greater than 1 part per million (ppm) of PCBs were also removed and disposed of offsite.

The FS also set various guidelines called action levels that guided soil removal activities. Soil that had concentrations at or higher than these action levels were disposed of offsite at a U.S. EPA approved facility. The soils and sediments that remain onsite contain very low levels of polynuclear aromatic hydrocarbons (PNAs). These levels are below the action levels, and do not present environmental or public health risks.

The sediment data in the RI showed concentrations well below the suggested action levels. Therefore, sediment was not removed.

All buildings and equipment onsite were removed and disposed of offsite. The concrete foundation were also removed and soil underneath was sampled to verify that no contamination exists there.

PUBLIC COMMENTS/U.S. EPA RESPONSES

The draft A & F Feasibility Study was issued in October 1984. A public meeting was held on December 4, 1984, in the Town of Greenup, Illinois. A three week comment period followed. It was extended an additional two weeks to enable the public to more closely study the document. A final FS was submitted to U.S. EPA on January 18, 1985.

The verbal and written comments can be divided into the following categories:

- Soil and sediment
- Building and equipment
- Ground water

Comments that required a response by U.S. EPA are summarized in this section. Public comments are edited and sometimes paraphrased so similar comments can be combined. The intent has been to present the full range of topics without lengthy repetition. Issues related to soil and sediment, and building and equipment have been addressed in a separate document. This responsiveness summary will address only ground water issues.

GROUNDWATER

Comment:

If the ground water is going to be monitored, soils should also be removed.

U.S. EPA Response:

Soils containing amounts of contaminants greater than the action levels have already been removed.

Comment:

The feasibility study's claim that dilution reduces ground water contamination to near background levels is unsupported.

U.S. EPA Response:

Additional support that dilution does cause ground water contamination to be reduced to near background levels was documented in the revised FS. While additional monitoring would be conducted under the requirements of the Partial Consent Decree, the existing levels of contaminants do not pose a threat to human health, welfare or the environment.

Comment:

Contamination in wells M-5D and M-6D are probably the result of soil contamination north and west of the site.

U.S. EPA Response:

Lagoons were excavated to the depths of the aquifer in which the wells received water. Leaching from lagoons while the site was in operation is

a more likely source of contamination because areas west and north of the site are not believed to be contaminated.

Comment:

If, after the soil is removed, ground water monitoring shows that contamination is not declining, what will U.S. EPA do?

U.S. EPA Response:

The action levels that will be used for ground water are different than those used for soils. A plan will be prepared to see what should be done in the event that groundwater contamination levels increase above the groundwater action levels, although this is not expected to happen.

Comment:

A 10-year ground water monitoring program is insufficient.

U.S. EPA Response:

U.S. EPA agrees that 10 years is not long enough to monitor ground water. The actual length of ground water monitoring will be determined by the Groundwater monitoring plan which will be prepared by the responsible parties and submitted to U.S. EPA and the State for approval. However, 30-year and beyond monitoring programs are not uncommon.

Comment:

During a flood, could contaminants back up into city wells? (City wells are located across the Embarras River.)

U.S. EPA Response:

Soil contamination that presents any public or environmental threat has been removed. Therefore, flooding should present no danger to public wells, but additional monitoring wells may be needed to monitor for any possible water gradient reversal and resulting contamination transport that may occur as a result of the flooding.

MISCELLANEOUS

Many letters and verbal comments expressed concern and a desire for a total cleanup. Many letters said the site should be returned to the same condition it was before A & F Materials began operations.

U.S. EPA wholeheartedly agrees that the site should be left in a condition

which it presents no danger to the public and the environment. The Agency believes that the recommended alternative accomplishes this goal.

ALERT, INC.

ACID COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #1 Down 1'
Laboratory Identification: 91100
Sample Matrix: Soil

Date rec'd: 9/10/85
Date extracted: 9/10/85
Date analyzed: 9/12/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	3.3
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*	Benzoic Acid	2.1
2-Methyl-4,6-dinitrophenol	ND*		
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 1 ug/g)
ND * (None detected, lower detectable limit = 5 ug/g)

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ALERT, INC.

ACID COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #1 Down 2'
Laboratory Identification: 91101
Sample Matrix: Soil

Date rec'd: 9/10/85
Date extracted:
Date analyzed:

ANALYSIS NOT REQUIRED

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LABORATORIES, INC.

ALERT, INC.

ACID COMPOUNDS ANALYTICAL REPORT

Company: Engineering Science
Sample Identification: Lagoon #4 Top
Laboratory Identification: 91102
Sample Matrix: Soil

Date rec'd: 9/10/85
Date extracted: 9/10/85
Date analyzed: 9/12/85

4-Chloro-3-methylphenol	ND	4-Nitrophenol	ND*
2-Chlorophenol	ND	Pentachlorophenol	ND*
2,4-Dichlorophenol	ND	Phenol	ND
2,4-Dimethylphenol	ND	2,4,6-Trichlorophenol	ND
2,4-Dinitrophenol	ND*		
2-Methyl-4,6-dinitrophenol	ND*		
2-Nitrophenol	ND		

Note: ND (None detected, lower detectable limit = 1 ug/g)
ND * (None detected, lower detectable limit = 5 ug/g)